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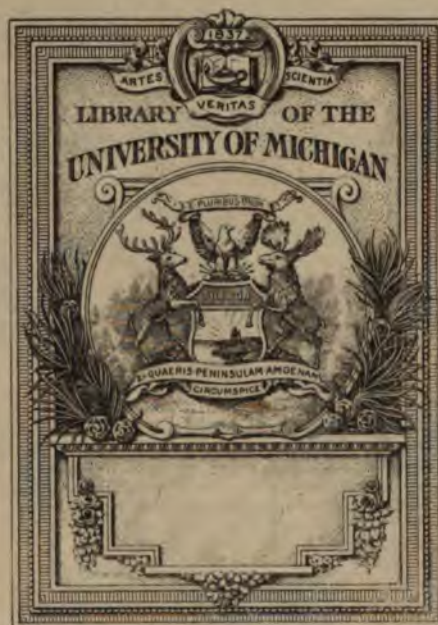
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S. Lake survey
Survey of Northern
and Northwestern
Lakes.

Bull. No. 12 C.

University of Michigan.

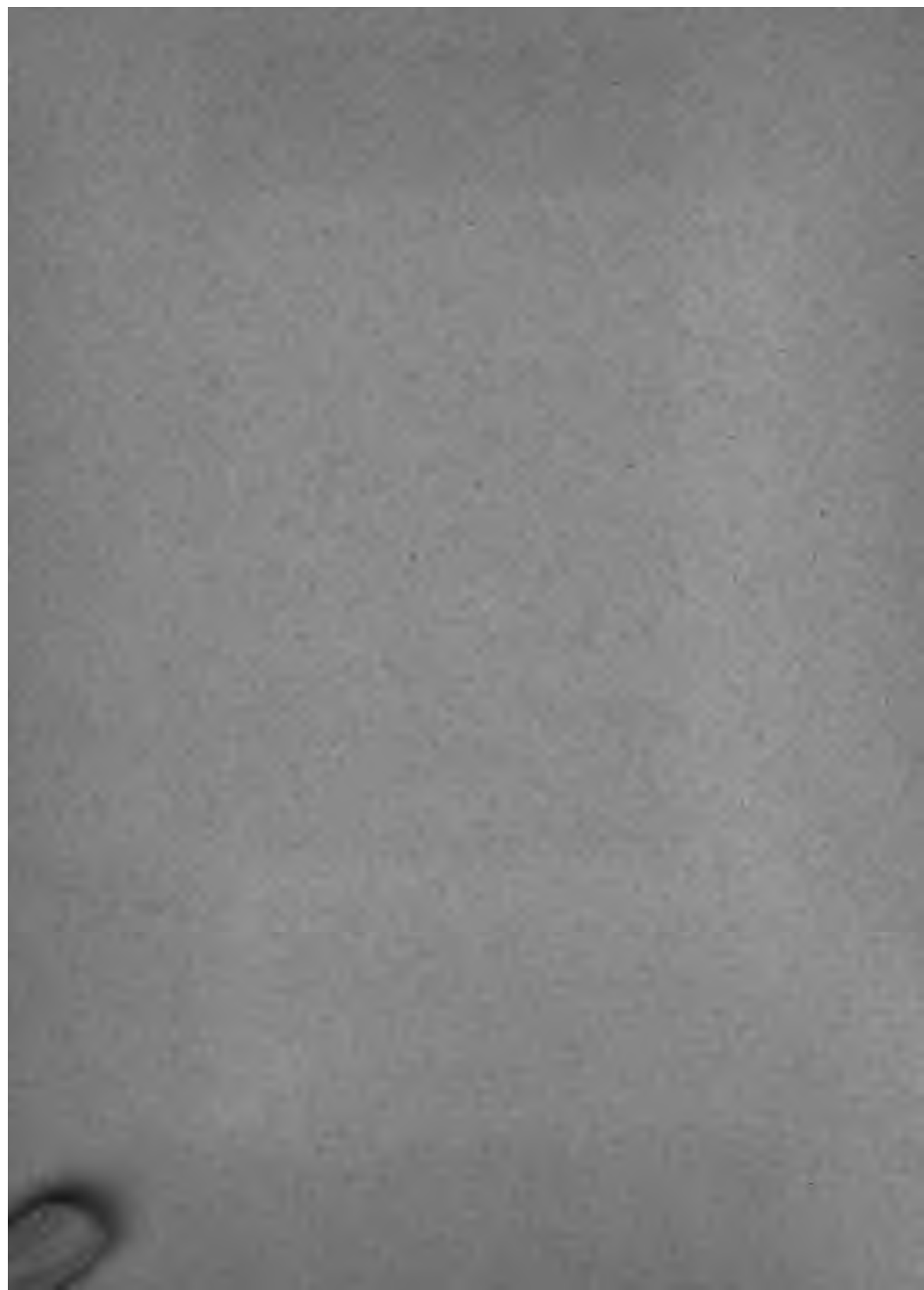


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WAR DEPARTMENT.
CORPS OF ENGINEERS, U. S. ARMY.



Survey of Northern and Northwestern Lakes.

BULLETIN No. 12 C.

LAKE HURON, ST. CLAIR RIVER, LAKE ST. CLAIR, AND DETROIT RIVER.

TO SUPPLEMENT THE INFORMATION GIVEN UPON THE CHARTS
OF THE GREAT LAKES, AND ISSUED WITH THOSE
CHARTS FROM THE OFFICE U. S. LAKE
SURVEY, DETROIT, MICH.

(ALL PREVIOUS BULLETINS FOR THE ABOVE-NAMED WATERS SHOULD BE DESTROYED.)

NOTE.—This bulletin may also be obtained, upon application, from the following U. S. Engineer Offices:
Duluth, Minn., 519 Providence Building; Milwaukee, Wis., Custom-House; Chicago, Ill., 1637 Indiana avenue;
Grand Rapids, Mich., 57 Park street; Detroit, Mich., Campan Building; Cleveland, Ohio, Hickox Building,
185 Euclid avenue; Buffalo, N. Y., 540 Federal Building; Oswego, N. Y., Second National Bank Building.

G. L. GILLESPIE,
BRIG. GEN., CHIEF OF ENGINEERS, U. S. ARMY.
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WAR DEPARTMENT,
Document No. 157,
OFFICE OF THE CHIEF OF ENGINEERS.

THE GREAT LAKES, THEIR HARBORS, CHANNELS, AND NAVIGABLE TRIBUTARIES.

BULLETIN NO. 12 C, APRIL 29, 1902.

The charts to which the information pertains are designated in *italics* for each harbor, channel, or tributary.
Bearings are true and distances are given in statute miles.

LAKE HURON.

Length, steamer track, Detour Passage to Fort Gratiot.....	miles..	220
Length, steamer track, Straits of Mackinac to Fort Gratiot	do...	243
Length (right line), Drummond Island (at nearest point to entrance to False Detour) to Point Harris	miles..	206
Breadth (right line), about 44° 35' north latitude.....	do...	101
Depth, maximum recorded by Lake Survey	feet..	750
* Area of water surface.....	square miles..	23,200
* Area drained	do...	52,100
* Area (total) of basin.....	do...	75,300
† Rainfall, average, annual	inches..	32
‡ Mean surface above mean tide at New York City (43 years, 1860- 1901)	feet..	581.05
‡ Standard high water (of 1893) above mean tide at New York City	do...	584.34
‡ Standard low water (adopted for new charts) above mean tide at New York City	feet..	578.00
‡ Mean surface below mean surface of Lake Superior.....	do...	20.69
‡ Mean surface below mean surface of Lake Michigan	do...	0.0
‡ Mean surface above mean surface of Lake Erie	do...	8.32
* Opening of navigation, average date at Fort Gratiot, Mich.....	Apr.	6
* Closing of navigation, average date at Fort Gratiot, Mich.....	Dec.	19

† U. S. WEATHER BUREAU STORM-WARNING DISPLAY STATIONS.

ALPENA, MICH. *Flagstaff*.—Bolton Building, corner Fletcher and Dock streets. Electric lights.

PRESQUE ISLE LIGHT.

BAY CITY, MICH. *Flagstaff*.—1011 Water street.

CHEBOYGAN, MICH. *Flagstaff*.—Foot of Main street, 40 yards from Steamboat Dock.

DETOUR, MICH. *Flagstaff*.—Coal chute, Pickands, Mather & Co.'s Dock.

* Deep Waterways Commission, 1896.

‡ Subject to correction; measurements now in progress.

† United States Weather Bureau.

EAST TAWAS, MICH. *Flagstaff*.—City Flagstaff, shore end Commercial Dock. Electric lights.

TAWAS POINT. *Flagstaff*.—At Ottawa Life-Saving Station.

MACKINAC ISLAND, MICH. *Flagstaff*.—At end of Geo. T. Arnold's Dock.

MIDDLE ISLAND, MICH. *Flagstaff*.—North end of island, 336 yards east-northeast from Life-Saving Station.

OSCODA, MICH. *Flagstaff*.—On Union Steamboat Dock.

POINTE AUX BARQUES, MICH. *Flagstaff*.—Eighty-four yards south of Pointe aux Barques Lighthouse.

PORT HURON, MICH. *Flagstaffs*.—United States Customhouse. Kendall Marine Company, foot of Sarnia street. Miller's Coal Dock. Electric lights.

LAKEVIEW BEACH LIFE-SAVING STATION.

HARBOR BEACH, MICH. *Steel tower*.—High ground near F. & P. M. Railway depot.

THUNDER BAY ISLAND, MICH. *Flagstaff*.—Extreme southeast end of island.

*CANADIAN STORM-WARNING STATIONS.

BAYFIELD, ONT.—*Signal mast* overlooking harbor.

COLLINGWOOD, ONT.—*Signal mast* on the approach to the main steamboat wharf.

GODERICH, ONT.—*Signal mast* on bluff near lighthouse.

KINCARDINE, ONT.—*Signal mast* on the bluff overlooking the harbor.

MIDLAND, ONT.—*Signal mast* on the Grand Trunk Railway wharf.

OWEN SOUND, ONT.—*Signal mast* on the west side of harbor opposite C. P. R. station.

PARRY SOUND, ONT.—*Signal mast* on a high ridge of land overlooking harbor.

SARNIA, ONT.—*Signal mast* on the town wharf adjoining waterworks property.

SAUGEEEN, ONT.—*Signal mast* on the lake shore foot of the main street.

TOBERMORY, ONT.—*Signal mast* on the point between the two harbors.

†UNITED STATES LIFE-SAVING STATIONS.

BOIS BLANC ISLAND, MICH.—At Walkers Point, east side of island.

GRINDSTONE CITY, MICH.—About 2 miles northeast of Port Austin and about 2 miles southeast of Port Austin Reef Light.

HAMMOND BAY, MICH.—Southerly end of Hammond Bay.

LAKE VIEW BEACH, MICH.—Five miles north of Fort Gratiot Light.

MIDDLE ISLAND, MICH.—North end of island.

POINTE AUX BARQUES, MICH.—Near light.

OTTAWA POINT, MICH.—Near light on Tawas Point.

SAND BEACH, MICH.—In harbor, inner end of dock.

STURGEON POINT, MICH.—Near light.

THUNDER BAY ISLAND, MICH.—West side of island.

CANADIAN LIFE-SAVING STATIONS.

COLLINGWOOD, ONT.

GODERICH, ONT.

* United States Weather Bureau.

† Reports of United States Life-Saving Service.

DANGERS.

(Coast line, channels, islands, and outlying reefs. For dangers in bays and harbors, see description of localities.)

- I.—WEST SHORE, FROM ST. CLAIR RIVER TO STRAITS OF MACKINAC.
- II.—ENTRANCE TO STRAITS OF MACKINAC.
- III.—NORTH SHORE, ST. IGNACE TO CAPE HURD, AT SOUTH SIDE OF ENTRANCE TO GEORGIAN BAY.
- IV.—EAST SHORE, FROM CAPE HURD TO ST. CLAIR RIVER.

I.—WEST SHORE, FROM ST. CLAIR RIVER TO STRAITS OF MACKINAC.

(a) *From Fort Gratiot light to Pointe aux Barques light.* A shoal with spits having depths of 13 to 17 feet, extends from Fort Gratiot light northward to beyond Gratiot Beach, and $\frac{1}{2}$ mile offshore. Corsica Shoal, with a depth of 17.7 feet at mean stage, lies $\frac{1}{2}$ mile, and Harlem Shoal, with a depth of 17.9 feet at mean stage, lies $\frac{1}{2}$ mile east of the axis of the ship channel and abreast of Huronia Beach. Northwest Shoal, with a depth of 15 $\frac{1}{2}$ feet at mean stage, lies 1,250 feet S. $\frac{1}{2}$ E. of Lake Huron Light Vessel No. 61. Between this light vessel and Lexington the coast should not be approached nearer than 1 $\frac{1}{4}$ miles. There is a detached rocky shoal, with a depth of 17 feet at mean stage, $\frac{1}{2}$ mile northeast of the mouth of Burch Creek. From Lexington to Port Sanilac the coast is rocky and can be approached to within 1 mile. Above Port Sanilac the character of the coast continues rocky. One mile north of Port Sanilac light, and $\frac{1}{2}$ mile offshore, there is a spot with a depth of 3 feet at mean stage. One-half mile off Indian Creek, in a northeasterly direction, there are two 5-foot rocky spots. At White Rock Point there are rocks and rocky spots extending $\frac{1}{2}$ mile offshore, and this character continues to Elm Creek, where a bad spit, with depths of 4 to 9 feet, extends $\frac{1}{2}$ mile in a north-northeasterly direction. Off Forest Bay there are several dangerous ledges with depths of 6 to 17 feet at mean stage, running north and south, 1 to 1 $\frac{1}{2}$ miles from shore. From Forest Bay to Pointe aux Barques light, boulders and rocky spots are found within $\frac{1}{2}$ mile from shore. There are in the neighborhood of Pointe aux Barques light a dangerous reef, with a depth of 6 feet, marked by a black bell buoy, 2 $\frac{1}{4}$ miles E. $\frac{1}{2}$ S. from the light; a rock nearly awash, $\frac{1}{2}$ mile east; an 8-foot spot, 1 $\frac{1}{4}$ miles NNE.; and boulders with 15, 16, and 17 feet of water over them, from 1 $\frac{1}{2}$ miles to over 2 miles in a northeasterly and northerly direction from the light.

Charts: Lake Huron; South End of Lake Huron; St. Clair River; Saginaw Bay; Sand Beach Harbor of Refuge.

(b) *From Pointe aux Barques light to Port Austin Reef light.* Ledges and detached rocky spots render this coast dangerous within 2 $\frac{1}{4}$ miles from shore. Orion Rock, with 5 feet of water over it, lies 1 $\frac{1}{4}$ miles northwest of the wharf at Huron Village. A rocky ledge extends out and around Burnt Cabin Point $\frac{1}{2}$ mile to 1 mile from shore, but there is good water in a NNE. direction, $\frac{1}{2}$ mile off Pointe aux Barques, between the Burnt Cabin Point Ledge and Pointe aux Barques Reef, which reaches northwest 1 $\frac{1}{4}$ miles from the mainland, and extends beyond Port Austin Reef light. Seven-eighths of a mile NNW. of this light there is a reef, with a depth of but 13 feet at mean stage, running in an east

and west direction for nearly $\frac{1}{2}$ mile. It is marked by a second-class black can buoy, No. 3, moored in 16 feet of water.

Charts: Saginaw Bay; Lake Huron.

(c) *Shores of Saginaw Bay from Port Austin Reef light to Au Sable Point.* See Saginaw Bay.

(d) *From Au Sable Point to Thunder Bay.* Three detached shoals with 17, 16, and 17 feet least depth at mean stage, lie $1\frac{1}{2}$ miles north of Au Sable or Fish Point and $1\frac{1}{2}$ to $1\frac{3}{4}$ miles from shore, extending $2\frac{1}{2}$ miles in a northerly direction. Inside of these shoals the wreck of the steamer *Baltimore* lies 2.81 miles S. by E. $\frac{1}{2}$ E. from Au Sable pierhead light in 22 feet of water. The wreck is now marked by a spar buoy. The wreck of the tow barge *Thomas P. Sheldon* lies about 2 miles southward of Au Sable pierhead light and $\frac{1}{2}$ mile northwest of the wreck of the *Baltimore*. A shoal with 18 feet depth extends in a northeasterly direction from 2 miles below the mouth of the Au Sable River to a point over 1 mile east of Au Sable pierhead light. Rocky spots are found as follows: 5 miles north of Au Sable pierhead light, with depth of 15 feet, $1\frac{1}{4}$ miles from shore; a spot with 16 feet, 7 miles north of Au Sable pierhead light, $1\frac{1}{4}$ miles from shore; a spot with 14 feet depth, $9\frac{1}{4}$ miles from Au Sable pierhead light, $1\frac{1}{4}$ miles from shore; and a 14-foot spot, 12 miles north of Au Sable pierhead light, 1 mile offshore. A detached shoal, with 17 feet least depth of water, lies with its northerly end 2 miles south of Harrisville, extending north and south $\frac{1}{2}$ of a mile and about $\frac{3}{4}$ of a mile in width. Shoal water, with 14 feet least depth, extends 1 mile offshore from a point about 1 mile south of Harrisville. A spit with a depth of 15 feet at its outer extremity extends 1 mile ENE. from Sturgeon Point. It is reported that there is an unsurveyed shoal about $3\frac{1}{2}$ miles NNE. of Sturgeon Point light, and about $2\frac{1}{2}$ miles E. by S. from "The Cove," with a depth of only 17 feet. A detached rock, with 16 feet depth of water, lies 1 mile northeast of "The Cove." There is also a detached rocky ledge with 15 feet least depth of water $1\frac{1}{4}$ miles south of the mouth of Black River and 1 mile offshore. Four rocky spots, two with 11 feet, one with 13 feet, and one with 15 feet least depth at mean stage, lie from $1\frac{1}{4}$ to $1\frac{3}{4}$ miles offshore on the bearings, respectively, E. by S. $\frac{1}{4}$ S., E. $\frac{1}{4}$ N., E. by N., and ENE., off the mouth of Black River. Foul ground extends from the shore to Black River Island. Between Black River Island and South Point the shore should not be approached within 2 miles.

Charts: Lake Huron; Thunder Bay.

(e) *Thunder Bay.* See Thunder Bay.

(f) *Thunder Bay to Straits of Mackinac.* At North Point, Thunder Bay, a shoal sets out in a SSE. direction for $1\frac{1}{2}$ miles, with a depth of but 11 feet at mean stage; the extreme south end is marked by a red gas buoy, fixed white light 10 seconds, eclipsed 10 seconds, moored in 22 feet of water. There is foul ground between Sugar Island and the mainland. Spits extend $\frac{1}{2}$ mile southeast of Sugar Island and 330 yards southeast of Thunder Bay Island. From Crooked Island to Middle Island the main shore may be approached within $\frac{1}{2}$ mile. There is a shoal midway between Middle Island and the mainland with a least depth of 6 feet, and other patches with depths of 16 and 17 feet make this passage dangerous for strangers. A detached rocky shoal, with a depth of 3 feet, 1,000 yards ESE. from the southeast point of Middle Island, is marked on its eastern edge by a second-class red nun buoy moored in 21 feet of water. Flats extend $\frac{1}{2}$ mile south of the south point of Middle Island and for about 400 yards off the southwest side and 400 to 700 yards off the northwest side of the island. From the

point at the southwest side of False Presque Isle Harbor, flats and detached shoals extend southeasterly for 2 miles; the outer patch, with a depth of 17 feet, lies $1\frac{1}{2}$ miles offshore. The bight in front of Lake Esau has several patches of 3 and 4 feet depth, and shoal water extends $\frac{1}{4}$ mile from shore. One thousand yards E. $\frac{1}{4}$ S. from the old lighthouse at Presque Isle Harbor, there is an extensive shoal with a depth of 9 feet, with a 15-foot shoal a short distance southeast of it. There is a 4-foot spot 1 mile southeast of Adams Point and $\frac{1}{2}$ mile offshore. The coast from Adams Point to abreast of Cheboygan light can be approached to within $\frac{1}{4}$ mile.

Charts: Lake Huron; Thunder Bay; Presque Isle and Middle Island; Straits of Mackinac.

II.—ENTRANCE TO STRAITS OF MACKINAC.

Cheboygan Shoal, $\frac{1}{4}$ mile NNE. $\frac{1}{4}$ E. of Cheboygan light, has a depth of only $14\frac{1}{2}$ feet; it is marked by a second-class black nun buoy moored on the northern side of the shoal in 16 feet of water. Shoal water extends from the east of Cheboygan light through north, around into McLeod or Duncan Bay, in which there are many shoal spots. Flats extend off the mouth of Cheboygan River; a channel has been dredged through them to the mouth of the river, with a depth of 18 feet at mean stage. There is a 10-foot patch $\frac{1}{2}$ mile NW. by W. from Cheboygan Crib light, and a 3-foot rock $1\frac{1}{2}$ miles NW. by W. $\frac{1}{2}$ W. from the same light, is $\frac{1}{2}$ mile from shore. From this point to the Mackinaw railroad docks the coast can be approached to within $\frac{1}{4}$ mile. A spit with a depth of 15 feet runs out 1 mile southeast from the southeast point of Bois Blanc Island. Five-eighths of a mile south of the point of this spit, a detached shoal, called Poe Reef, extending east and west $1\frac{1}{2}$ miles, with a least depth of 12 feet, lies with its eastern extremity 2 miles southeast of the southeast end of Bois Blanc Island. Poe Reef light vessel (with fog whistle) is moored in 30 feet of water $1\frac{1}{4}$ miles off the southeastern end of this reef. On the southwest side of Bois Blanc Island, at a point about halfway between Point aux Pins and the northwest end of the island, Zela Shoal, a narrow spit, with a least depth of 5 feet, and a depth of but 9 feet at its western end, runs out 2 miles in a northwesterly direction; a red can buoy marks the extremity. There is no passage between this buoy and the island. Majors Shoal, a dangerous 14-foot rocky reef, 1,200 feet long, northwest and southeast, lies $2\frac{1}{2}$ miles SW. by W. from Round Island light, and is marked by a red and black horizontal striped can buoy moored in 19 feet of water. The South Graham Shoal, with a least depth of 5 feet, lies $1\frac{1}{2}$ miles S. $\frac{1}{4}$ W. from Point St. Ignace, and is marked on its southeasterly edge by a red automatic bell buoy moored in 24 feet of water. North Graham Shoal with a least depth of 7 feet, lies $\frac{1}{4}$ mile SSE. from Point St. Ignace, and is marked by a red can buoy. These shoals lie $\frac{1}{4}$ mile apart in a northeast and southwest direction from each other. There is a channel between the shoals and Point St. Ignace, but it should not be attempted by strangers. A spit extending off the south point of Mackinac Island is marked by a red gas buoy showing a fixed red light 10 seconds, eclipsed 10 seconds. Vessels must pass to the southward of this buoy taking care to avoid the shoal with 17 feet depth, $\frac{1}{4}$ mile northeast of Round Island light. There is a detached and dangerous spit with a depth of 16 feet, $\frac{1}{2}$ mile northwest of Bois Blanc light. Raynolds Reef, with a least depth of 12 feet, lies $3\frac{1}{2}$ miles W. $\frac{1}{4}$ N. of Spectacle Reef light; the northern edge is marked by a red and black horizontal striped can buoy moored in 17 feet of water. Spectacle Reef lies $10\frac{1}{2}$ miles east of the east point of Bois Blanc Island; it is about

$\frac{3}{4}$ mile long north and south, and has a least depth of 7 feet. At the northwest-ern edge there is a square crib with a light flashing red and white every 30 seconds, and visible $17\frac{1}{2}$ miles, serving as a guide for vessels bound from Detour to the Straits of Mackinac by the South Channel. The south end of the reef is marked by a second-class red nun buoy moored in 20 feet of water.

Charts: Straits of Mackinac; North End of Lake Michigan; Lake Huron; Lake Michigan.

III.—NORTH SHORE, ST. IGNACE TO CAPE HURD, AT SOUTH SIDE OF ENTRANCE TO GEORGIAN BAY.

(a) *From Point St. Ignace to Detour Passage.* A detached spot with a depth of 17 feet lies $\frac{1}{4}$ mile SE. by S. off the southeasterly point of Rabbits Back Peak. Another detached 17-foot spot lies $1\frac{1}{2}$ miles offshore about halfway between Rabbits Back Peak and Gross Point. East of Gross Point, at a distance of $\frac{3}{4}$ mile, there is a 9-foot spot. From the southerly end of Ile St. Martin, rocky shoals and spits with depths of 4 to 14 feet extend south and southeast $1\frac{1}{2}$ miles. South of Point St. Martin, at a distance of $\frac{3}{4}$ mile, there is a rocky reef with a least depth of 8 feet, running $1\frac{1}{2}$ miles in an east and west direction. There is good water between the point and the reef. Goose Island Shoal, a dangerous reef lying 3 miles southwest of Goose Island, has a least depth of 5 feet; it extends $\frac{1}{4}$ mile north and south, and is $\frac{1}{4}$ mile in breadth. Great care should be taken to avoid it. Goose Island is surrounded by shoals, and a rocky reef extends from its southerly end, 1 mile in a SSE. direction. Along the coast from Point Fuyards to Beaver Tail Point, there are many indentations formed by the islands of Les Cheneaux. The inlets and channels between these islands have deep water, but, on account of the off-lying shoals, they are practically useless except for small craft. Martin Reef (marked at its southeasterly extremity by a black gas buoy moored in 20 feet of water, showing a light fixed white 10 seconds, eclipsed 10 seconds, and situated 4 miles S. by E. $\frac{3}{4}$ E. from Beaver Tail Point) is a rocky shoal with patches having depths of but 6 to 10 feet at the present stage. This reef is a menace to navigation, as it lies near the track of vessels from Detour Passage to Mackinac Island. From Martin Reef, Tobin Reef, with a least depth of 5 feet, Surveyors Reef, with a least depth of 6 feet, and other detached shoals with depths of 12 to 16 feet, extend in a northwesterly direction to the mainland, with channels between them which should not be attempted by strangers. Between Beaver Tail Point and Detour light there are several out-lying shoal patches, and the shore should not be approached within $1\frac{1}{2}$ miles. Detour Reef, a rocky shoal, with a least depth of 17 feet at the present stage, lies $\frac{3}{4}$ mile SE. by E. $\frac{1}{4}$ E. from Detour light. A black gas buoy, moored in 18 feet of water, and showing a fixed white light 10 seconds, eclipsed 10 seconds, marks the southeasterly edge of this reef. This gas buoy, in range with Detour light, marks the turning point from Lake Huron courses into Detour Passage.

Charts: Straits of Mackinac; St. Marys River, No. 1; North End of Lake Michigan; Lake Huron; Lake Michigan.

(b) *From Detour Passage, along the south shore of Drummond Island, to False Detour.* A boulder with a depth of 12 feet and with 26 feet of water around it, has been located $\frac{1}{4}$ mile southwest of Barbed Point; there are a number of boulders in this vicinity with less than 20 feet over them; a red spar buoy marks the most western boulder off Crab Island. Five hundred yards south of Barbed Point or Crab Island there is a detached shoal running

ESE. and WNW. for $\frac{3}{4}$ mile, with a least depth at present stage of only 1 foot. There are 37 feet of water between this shoal and the point. There are three detached reefs, with deep water between, lying in a southwest direction from Garden Island. The outer rock, with a depth of only 9 feet at the present stage, is about $1\frac{1}{4}$ miles southwest of Garden Island, and nearly on a line with the southeast end of Espanore Island and Detour light. The middle reef is awash and lies $\frac{3}{4}$ mile south of Bellevue Island. The inner reef, with its southwestern point about $\frac{3}{4}$ mile southwest of the southwestern end of Garden Island, has a depth of 6 feet; there is a 38-foot channel between this reef and Garden Island. A detached 6-foot reef, with scattering bowlders, lies about 1 mile NW. by W. from the southwest point of Espanore Island, and in line with that point and Barbed Point. There is an 18-foot spot between this reef and the southwest point of Espanore Island. Rocky ledges and bowlders extend $\frac{1}{2}$ mile southwest from the south point of Espanore Island. A patch of rocks $\frac{1}{2}$ mile in width from north to south, with depths of 3 and 4 feet and with scattered bowlders, extends $\frac{1}{2}$ mile east from the northeast point of Espanore Island, narrowing the entrance into Island Harbor to a width of 400 yards. From the small island near the middle of the entrance to Huron Bay, rocky spots, with depths of 3 to 10 feet, extend $\frac{1}{2}$ mile in a southerly direction. One-half mile to eastward of this island there are rocky ledges with depths of 6, 8, and 14 feet, extending $1\frac{1}{2}$ miles south from the rocky west point of the east shore of Huron Bay. Off the south point of Meade Island, in a southwesterly direction, there are two detached groups of reefs, with a least depth of 8 feet, surrounded by bowlders. The outer reef, $1\frac{1}{2}$ miles from Meade Island, is awash and is in the shape of a horseshoe; it is formed by two parallel ledges, 500 yards apart, and connected at their southerly ends; the easterly ledge runs N. by E. and S. by W. for $\frac{1}{2}$ mile; the westerly ledge is $\frac{3}{4}$ mile long, north and south. The inner reef, $\frac{1}{2}$ mile from Meade Island, is $\frac{3}{4}$ mile long from northwest to southeast, and has a least depth of 10 feet. From a point on the shore of Drummond Island, about 1 mile west of Meade Island, a 15-foot spit runs out in a southerly direction, over $\frac{1}{2}$ mile toward the easterly side of the horseshoe; between the spit and the horseshoe there is a 35-foot channel $1\frac{1}{4}$ miles in width. South of Scammon Point, two detached 6-foot and 11-foot reefs, at distances of $\frac{3}{4}$ mile and $\frac{1}{2}$ mile, respectively, form dangerous obstructions in entering Scammon Cove. From the south point of the east shore of Scammon Cove, rocky spits, with a depth of only 2 feet, extend in a SSW. direction $1\frac{1}{2}$ miles, expanding at the outer end into a broad ledge with depths of 6, 9, and 14 feet among bowlders, extending in an ENE. direction for $1\frac{1}{2}$ miles. A small shoal, with a least depth of $12\frac{1}{2}$ feet, lies $\frac{1}{4}$ of a mile south of a point which is $\frac{3}{4}$ of a mile east of the east side of the entrance to Scammon Cove. There is a 6-foot rock $\frac{3}{4}$ mile S. by W. off the east point of Harbor Island, and a 10-foot rocky shoal lies $1\frac{1}{4}$ miles ENE. $\frac{1}{4}$ E. from this rock and $\frac{3}{4}$ mile SW. from the point on the west side of the entrance to False Detour Channel. A sharp lookout must be kept for these last two reefs in entering False Detour Channel from the west.

Charts: St. Marys River, No. 1; Straits of Mackinac; Lake Huron.

(c) *From False Detour, along the south shore of Cockburn Island, to Mississagi Strait.* Wheeler Reef (rock awash), off the eastern entrance to False Detour Channel, extends $\frac{1}{2}$ mile northwest and southeast; it is $\frac{1}{2}$ mile off the southwesterly side of Kitchener Island, and there is a 21-foot channel midway between the reef and the island. Wagosh Reef, in Wagosh Bay, extends from the middle and northerly shore of the bay in a S. by E. $\frac{1}{4}$ E. direction, for $1\frac{1}{4}$

miles with a least depth of 7 feet. McKay Reef, an extension of Wagosh Reef and lying 1 mile SSE. from it and $\frac{1}{2}$ mile SSW. from Pulpwood Point, has a least depth of 12 feet. In a southeast direction off Boom Point, the most southerly point of Cockburn Island, there are distinct groups of reefs known as the Magnetic Reefs. The inner, called the West Reef, is 1 mile southeast of Boom Point and has a least depth of 6 feet; Middle Reef, with a least depth of 7 feet, lies $1\frac{1}{2}$ miles E. by S. $\frac{1}{2}$ S. from Boom Point; East Reef, the largest and most dangerous of the group, has a least depth of 3 feet and extends 1 mile in a N. by E. and S. by W. direction; it is $2\frac{1}{2}$ miles from Boom Point, between the bearings E. and SE. by E. $\frac{1}{2}$ E. from that point. South Reef, least depth 9 feet, is an extension of Middle Reef to S. by W. for $1\frac{1}{2}$ miles. There is a narrow passage of 19 feet depth between the West and Middle reefs. A 1,000-foot channel, running in a north and south direction, with $3\frac{1}{2}$ to 5 fathoms of water, lies between the easterly edges of Middle and South reefs and the westerly edge of East Reef. North Rock is a detached rock with less than 6 feet depth, lying $\frac{1}{2}$ mile north of Middle Reef and $\frac{1}{2}$ mile offshore. Castilian Shoal, with a depth of less than 6 feet, lying $1\frac{1}{2}$ miles southeast of Magnetic Island, is another dangerous reef at the west entrance to Mississagi Strait.

Chart: Lake Huron.

(d) *From Mississagi Strait, along the south shore of Manitoulin Island, to Owen Channel.* Carter Rock, with 4 feet depth, is on a detached reef at the eastern entrance to Mississagi Strait, $1\frac{1}{2}$ miles WSW. from Lynn Point. Purvis Reef, with a least depth of 5 feet, extends 1 mile SE. by E. $\frac{1}{2}$ E. from Lynn Point toward the west side of Greene Island. Reefs extend from Greene Island to Manitoulin Island, the most prominent being Mink Reef, with less than 6 feet depth. A spit, with a depth of $19\frac{1}{2}$ feet, extends $\frac{1}{2}$ of a mile southeast of the easternmost point of Greene Island, narrowing the entrance to Greene Island Harbor. Jones Reef is a detached shoal, with a least depth of 9 feet, $1\frac{1}{2}$ miles SSW. $\frac{1}{2}$ W. of Belanger Point. Ainslie Rock, with 4 feet of water over it, is a detached rock $\frac{1}{2}$ mile S. by E. from Girouard Point, with 15 feet of water $\frac{1}{2}$ mile beyond in the same direction. Three-fourths of a mile west of Ainslie Shoal there is a spot with a depth of $19\frac{1}{2}$ feet. Stafford Rock, with a depth of $7\frac{1}{2}$ feet, and a 19-foot shoal $\frac{1}{2}$ mile from it, lie 1 and $1\frac{1}{2}$ miles, respectively, SW. by W. $\frac{1}{2}$ W. from the southwesterly point of Burnt Island. Western Duck Reef, with a least depth of $7\frac{1}{2}$ feet, lying $1\frac{1}{2}$ miles northwest of Western Duck Island, extends 1 mile in a NE. by E. direction toward Stafford Rock and the southwest point of Burnt Island. Detached reefs, with 10 and 12 feet depth, extend $\frac{1}{2}$ mile off the north side of Western Duck Island. A long narrow reef, called the Thibault Shoal, with a depth of less than 6 feet, extends from Greene Point, on Manitoulin Island, to the north point of Inner Duck Island; two spits extend to the south and southeast from this island for $\frac{1}{2}$ mile; the easterly one, called Macaulay Spit, has a depth of 10 feet. A spit, with a depth of 7 feet, extends $\frac{1}{2}$ mile north from Middle Duck Island. Kipling Reef, with a least depth of 15 feet, lies $\frac{1}{2}$ mile W. by N. from the southwest point of Middle Duck Island. Manitoba Reef, awash, lies $\frac{1}{2}$ mile off the northerly point of Great Duck Island. Mary Shoal with a depth of 9 feet, Larry Rock with 13 feet, and Kitty Shoal with $10\frac{1}{2}$ feet, least depths, lie from $\frac{1}{2}$ to $1\frac{1}{2}$ miles off the southerly end of Great Duck Island. The Jennie Graham Shoal, with a least depth of $7\frac{1}{2}$ feet, lies nearly 2 miles off the south point of Great Duck Island and in line with Mary Shoal, the easterly extremities of Great Duck Island and the west side of Middle Duck Island. Shoal water extends from the southeasterly point of Great Duck

Island in a southeast direction to the middle of the west shore of Outer Duck Island with a depth of less than 6 feet. A rocky spit extending $1\frac{1}{2}$ miles south from the southern point of Outer Duck Island has a least depth of less than 6 feet, with only 13 feet at the outer extremity. Gaspesia Shoal, with 16 feet least depth, lies $\frac{1}{2}$ mile ESE. of Walkhouse Point, with a 30-foot channel between it and the point. Seaman Reef, with a least depth of 10 feet, is $1\frac{1}{2}$ miles NE. by E. $\frac{1}{2}$ E. from Walkhouse Point and $\frac{1}{2}$ mile offshore. Morrell Reef is a detached narrow shoal $\frac{3}{4}$ mile in length, north and south, with a least depth of 6 feet; its southern extremity lies $\frac{1}{4}$ mile WSW. of Goose Point and the northern extremity $\frac{3}{4}$ mile SSE. of the westerly point of the east shore of Carroll Wood Bay. Another detached shoal with a least depth of 12 feet lies $\frac{1}{2}$ mile southwest of Goose Point. Shoal water with rock bottom and bowlders, with less than 6 feet of water over them, extends $\frac{3}{4}$ mile in a southeasterly direction from Goose Point. Buller Reef, with a least depth of only 3 feet, lies at the westerly entrance to Hensley Bay, with a narrow spit extending due south for $1\frac{1}{2}$ miles from shore, with depths of 15 to 18 feet. Reefs with scattered bowlders run in a southwesterly direction $\frac{3}{4}$ mile from Misery Point. Methuen Rock, with less than 6 feet depth, lies $\frac{3}{4}$ mile SW. by W. from Misery Point. A series of detached reefs, one, called Taylor Reef, with a least depth of 13 feet, and other 15, 16, and 18 foot spots, extend in a north and south direction for $1\frac{1}{2}$ miles from the middle of Misery Bay; a 16-foot spot at the extreme southern end lies $1\frac{1}{2}$ miles SE. by S. from Misery Point. Saunders Rock, with 6 feet depth, is a detached shoal $\frac{1}{2}$ mile to the northeast of Taylor Reef and $\frac{1}{2}$ mile offshore. Frechette Bank, with less than 6 feet depth, is a dangerous reef lying 1 mile south of Frechette Point. Other detached spots with 15, 16, and 19 feet, least depths, lie $\frac{1}{2}$ mile to SSE., south and southwest of Frechette Bank and $1\frac{1}{2}$ miles from Frechette Point. The coast from Frechette Point to Gatacre Point should not be approached within $\frac{1}{2}$ mile. Shamrock Bank, with a depth less than 6 feet, extends from shore $1\frac{1}{2}$ miles in a southwesterly direction; its outer edge is $1\frac{1}{2}$ miles southeast of Gatacre Point. Thistle Reef, a long and narrow spit, with a depth of less than 6 feet at its inner, and of 10 feet at its outer extremity, extends $1\frac{1}{2}$ miles in a S. by W. direction, beginning $\frac{3}{4}$ mile off the east point inclosing Portage Bay. A 10-foot spot lies $1\frac{1}{2}$ miles southeast of Portage Point, and a shoal with a least depth of 15 feet is $1\frac{1}{2}$ miles SSE. of the same point. Shoal water extends $\frac{1}{2}$ mile offshore from Melville Point to Dominion Point, with two outlying 15 and 18 foot spots $1\frac{1}{2}$ miles WSW., and $\frac{1}{2}$ mile SW., respectively, from Dominion Point. Lougheed Reef, with a least depth of 12 feet, extends $\frac{3}{4}$ mile southwest of Lougheed Point, and Milton Reef, with a least depth of 6 feet, extends $\frac{3}{4}$ mile SW. by W. from Milton Point. Dean Spit, with a depth of 12 feet, extends over $\frac{1}{2}$ mile in a southwesterly direction from the point between Lonely and Dean bays. Shoal water in Dean Bay extends $\frac{3}{4}$ mile from shore with spots of 6, 9, and $13\frac{1}{2}$ foot depths, running in a SW. by S. direction along the middle of the bay. Simcoe Bank, with a depth of 12 feet, lies at the entrance to Providence Bay and runs $\frac{3}{4}$ mile from Simcoe Point in a SSW. direction. Between Providence Point and Timber Bay, shoal water extends $\frac{3}{4}$ mile offshore with reefs and rocks awash, the Everett Reefs being the most dangerous, with $13\frac{1}{2}$ feet $\frac{1}{2}$ mile from shore. Timber Bay Shoal is a detached reef with a bowlder 2 feet out of water, $1\frac{1}{2}$ miles WNW. of Jenkins Point. A detached 9-foot spot $\frac{3}{4}$ mile off the shore, lies 1 mile NW. by W. from the same point and at the northerly entrance to Hughson Bay. Buckeye Shoal, a detached reef with a depth of less than 6 feet, lies 1 mile south of Jenkins Point. A shoal with

a least depth of $13\frac{1}{2}$ feet, lies $\frac{1}{2}$ mile SW. by S. from the same point and $\frac{3}{8}$ mile W. by N. from Buckeye Shoal. The coast from Jenkins Point to Rathbun Point should not be approached within 1 mile, as it abounds in reefs and rocky ledges. From Rathbun Point a spit with 12 feet extends $\frac{1}{2}$ mile from shore. Chisholm Rock in Michael Bay has less than 6 feet of water over it, and lies $\frac{3}{4}$ mile SW. $\frac{1}{2}$ W. from the wharf. Advance Reef, a detached narrow rocky shoal $\frac{3}{4}$ mile in length from southwest to northeast, and with a depth of less than 6 feet, lies with its westerly end $2\frac{1}{2}$ miles westward of Michael Point light. From Michael Point a narrow spit with a least depth of 10 feet extends $1\frac{1}{2}$ miles in a W. $\frac{1}{2}$ S. direction. The bight between Michael and Walker points is blocked by reefs extending $1\frac{1}{2}$ miles from shore. Genesta Bank, with a depth of less than 6 feet, is a detached reef lying $1\frac{1}{2}$ miles southeast of Michael Point light. Between Walker Point and the South Baymouth range lights and $\frac{1}{4}$ mile SE. by S. from Walker Point, lies Volunteer Spit with a least depth of 13 feet. Red Dan Rock, nearly awash, lies $\frac{3}{8}$ mile SE. by S. from Birch Point, and Scotchie Reef, with Inkster Rock nearly awash, lies 800 yards SW. $\frac{1}{4}$ S. from Baymouth front range light and 170 yards west of South Baymouth range leading into South Bay. Another detached shoal with a least depth of 15 feet lies 300 yards east of South Baymouth range, and $1\frac{1}{2}$ miles S. by W. $\frac{3}{4}$ W. from South Baymouth front light. A spit, with a depth of less than 6 feet, extends $\frac{3}{8}$ mile S. by W. from Thomas Point. Todman Reef, with a least depth of 7 feet, lies in the middle of the entrance to Thomas Bay, 1 mile E. $\frac{1}{2}$ S. from Thomas Point. Six fathoms of water can be carried through the westerly channel leading into Thomas Bay, where good anchorage in 5 to 7 fathoms of water will be found. From the east entrance point of Thomas Bay to Hungerford Point, the shore should not be approached nearer than $1\frac{1}{2}$ miles. The Grantham Shoal, with a least depth of $7\frac{1}{2}$ feet, and Vigilant Rock, with a least depth of 12 feet, are detached rocky reefs 1 mile offshore and near the easterly entrance to Thomas Bay.

Chart: Lake Huron.

(e) *From Owen Channel to Cape Hurd, including the entrances to Georgian Bay.* Ship Bank, with a least depth of $7\frac{1}{2}$ feet, and Stewart Rock, with a least depth of 4 feet, lie at the entrance to Owen Channel and are separated from each other by a narrow channel of 4 fathoms. Beach Point flat is an extensive rocky bank with depths of 12 to 15 feet, fronting the beach on Fitzwilliam Island southwest of Beach Point; its northerly edge runs $\frac{1}{2}$ mile W. $\frac{1}{2}$ N. from Beach Point, and thence, under the name of The Ridge, it joins Owen Island bank with 12 to 16 feet of water. Owen Island bank, with depths of 12 to 18 feet, extends on all sides from Owen Island and to Hungerford Point on the west; a depth of 12 feet is found $\frac{1}{2}$ mile east of the south extremity of Owen Island and on The Ridge. Little Rock, with a least depth of $10\frac{1}{2}$ feet, lies $1\frac{1}{2}$ miles N. by E. $\frac{3}{8}$ E. from the westerly end of Perseverance Island. A rock, with a depth of 17 feet, lies $\frac{3}{8}$ mile northwest of Little Rock. There is shoal water along the entire western coast of Fitzwilliam Island; at Phoebe Point it extends $\frac{3}{8}$ mile southwest, covering Wild Bight and gradually deepening toward Perseverance Island and thence shoaling again to the south and southeast to within $\frac{1}{2}$ mile from shore of Fitzwilliam Island. Emily Maxwell Reef is an extensive rocky shoal, with a least depth of 4 feet, extending $1\frac{1}{2}$ miles in a southwest direction from a point 1 mile northwest of the extreme end of Indian Harbor Point. Indian Harbor Reef is a rocky ledge with depths varying from 4 to 18 feet and extending $\frac{3}{4}$ mile in a southwesterly direction from Indian Harbor Point. McLean Rock, with a least

depth of 9 feet, is a bad obstruction at the entrance to Fitzwilliam Channel. It is 300 yards long in an east and west direction, by 200 yards wide, and its center lies $1\frac{1}{2}$ miles S. by W. $\frac{1}{4}$ W. from Indian Harbor Point. Smith Rock is a small rocky patch, with a least depth of 15 feet, lying $1\frac{1}{2}$ miles south of Indian Harbor Point, and is another bad obstruction at the entrance to Fitzwilliam Channel. Manitoba Ledge, a dangerous reef at the southern edge of Fitzwilliam Channel, lies to the westward of Yeo Island. This ledge extends 1 mile north-east and south-west and is 700 yards in width; at its northeast end there are rocks awash; near the southwest extremity, a least depth of 5 feet is found. The southwest extremity of this ledge lies $\frac{1}{4}$ mile WSW. from the southwest point of Yeo Island. A channel with 6 $\frac{1}{2}$ fathoms separates this ledge from Yeo Island, but its passage should not be attempted by strangers. Two rocky patches, called East Sister and West Sister, with least depths of 18 feet, bear northwest $3\frac{1}{2}$ and $3\frac{1}{4}$ miles, respectively, from Cove Island light. Bad Neighbor Rock, with a least depth of 2 feet, is the most dangerous reef in Main Channel, and lies $2\frac{1}{2}$ miles NNW. $\frac{1}{4}$ W. from Cove Island light. In addition to this rock, two other small patches, each with a depth of 8 feet, lie SW. $\frac{1}{4}$ S. and S. $\frac{1}{4}$ W. 200 and 400 yards, respectively, from Bad Neighbor Rock. In approaching this reef from the eastward or southward in thick weather or at night great caution must be exercised, as the reef rises abruptly from 40 fathoms within 400 yards and from 30 fathoms within 150 yards. A black spar buoy is moored near the south end of this shoal. Gat Point Reef, with depths of 3 to 18 feet, extends SW. by S. $\frac{1}{4}$ mile from Gat Point, at the northwest extremity of Cove Island. A detached spot, with a least depth of 15 feet, lies $\frac{1}{2}$ mile S. by W. from the same point. The channel between Cove Island and Cape Hurd is nearly closed by outlying reefs, and strangers should never attempt the passage of McGregor Channel or Devil Island Channel. The following reefs form these obstructions: Northwest Bank, a rocky patch with depths of 6 to 15 feet, lying 2 miles in a southwest direction from Channel Point on the southwest coast of Cove Island; detached rocky spots, with a depth of less than 6 feet, running in a southwesterly direction off Cove Island Harbor and Turning Island, with depths of $6\frac{1}{2}$ to 15 feet $\frac{1}{2}$ mile WSW. from Turning Island; White Rock is one of these; Greenfield Rock is $\frac{1}{2}$ of a mile S. by W. from Turning Island; Middle Bank, a rocky ledge 1 mile long east and west, and the same distance northwest and southeast, with a depth of less than 1 foot on its inner side, and its westerly edge with 17 feet depth, lying nearly 3 miles NW. by N. $\frac{1}{4}$ N. of Cape Hurd; Southwest Bank, with a least depth of 9 feet, $\frac{1}{2}$ mile in length north and south and $\frac{1}{4}$ mile wide, with other detached 17-foot spots, $\frac{1}{4}$ mile to the southwest, lying with its northern extremity $2\frac{1}{2}$ miles NW. by N. of Cape Hurd; and Southeast Bank, extending northward $1\frac{1}{2}$ miles from Cape Hurd to within $\frac{1}{4}$ mile south of Devil Island, with a number of rocky ledges having a least depth of 3 feet, the outer ledge running $\frac{1}{2}$ mile in an east and west direction, its western extremity lying $1\frac{1}{2}$ miles north of Cape Hurd. A ledge extends to the south and east of Devil Island $\frac{1}{2}$ mile, with a least depth of 9 feet. Earls Patches is a detached rocky shoal extending $\frac{1}{2}$ of a mile from NE. to SW. and $\frac{1}{4}$ of a mile in width, with rocks on the north end and the west side, and a least depth of $7\frac{1}{2}$ feet. The south end is $\frac{1}{4}$ of a mile W. $\frac{1}{4}$ S. from Wreck Point. China Reef, with rocks and a depth of 12 feet at the extreme end, extends $\frac{1}{2}$ of a mile SW. $\frac{1}{4}$ W. from Wreck Point. Six fathoms can be carried through a tortuous channel south of Devil Island Shoal and between Earls Patches and China Reef into Georgian Bay.

Chart: Lake Huron.

IV.—EAST SHORE, FROM CAPE HURD TO ST. CLAIR RIVER.

From Cape Hurd to Lyal Island the coast is rocky and dangerous within $1\frac{1}{2}$ miles from shore. From Lyal Island along the Ghegheto Islands to Chiefs Point it is unsafe for a distance of 3 miles from shore; from Chiefs Point to Chantry Island, $1\frac{1}{2}$ miles is a safe distance, and the same character continues to Point Clark. At Point Clark a reef extends westward $1\frac{1}{2}$ miles from the shore, with a detached shoal $1\frac{1}{2}$ miles W. by S. of Point Clark light. Three and one-half miles south of Point Clark a similar reef, with a least depth of 4 feet, extends $1\frac{1}{2}$ miles from shore. From this last reef to Goderich the coast is less dangerous, and may be approached safely within $\frac{1}{2}$ mile. From Goderich to Cape Ipperwash the coast continues with the same character, and may be approached to within $\frac{1}{2}$ mile. At Cape Ipperwash a dangerous ledge extends to the north and northwest with a least depth of 4 feet, 1 mile from the cape, and 12 to 16 feet at the outer extremity, $1\frac{1}{2}$ miles from the cape. This reef with outlying shoals continues southwest along the shore with shoal water extending out for $1\frac{1}{2}$ miles, narrowing as it approaches the Point Harris shoal, with which it connects about 2 miles east of Point Harris. Shoal water continues thence along the shore, gradually widening to $\frac{1}{2}$ mile from shore northwest of Point Harris, and to about 1 mile from shore in the bay southwest, with detached 17 and 18 foot spots outside at the point and southwest of the point, at distances varying from $\frac{1}{2}$ to $1\frac{1}{2}$ miles from shore. About halfway between Point Harris and Errol the shoal rapidly approaches the shore, and from that point to the head of St. Clair River the coast is bold and gradually shelving, and can be approached with safety to within $\frac{1}{2}$ mile.

Charts: South End of Lake Huron; St. Clair River; Lake Huron.

HARBORS OF REFUGE AND ANCHORAGES.

I.—WEST SHORE, FROM ST. CLAIR RIVER TO STRAITS OF MACKINAC.

St. Clair River, head of. *See* St. Clair River—Port Huron and Sarnia.

Fort Gratiot light to Forestville; the holding ground close to shore is generally good; clay bottom is found off Lexington and above, in depths of 4 and 5 fathoms, and excellent holding ground is found in 5 fathoms southeast of the wharf at Forestville.

Sand Beach (Harbor Beach). *See* Sand Beach.

Port Hope; good holding ground north and east, in depths of 6 and 7 fathoms.

Saginaw Bay. *See* Saginaw Bay.

Tawas Bay. *See* East Tawas.

Au Sable Point; good holding ground and protection from all but northeast to southwest winds.

Thunder Bay. *See* Thunder Bay.

Sugar Island and Thunder Bay Island. *See* Sugar Island.

Middle Island. *See* Middle Island.

False Presque Isle. *See* False Presque Isle.

Presque Isle. *See* Presque Isle.

Hammond Bay. *See* Hammond Bay.

II.—NORTH SHORE, ST. IGNACE TO CAPE HURD.

Drummond Island. *See* Drummond Island.

False Detour Passage; good anchorage in 4 and 5 fathoms between Kitchener and Herschell islands, near west end of Cockburn Island, and protection from all winds.

Wagosh Bay. *See* Wagosh Bay.

Mississagi Strait; good shelter along either shore after passing Mississagi light to the north.

Greene Island Harbor. *See* Manitoulin Island.

Burnt Island Harbor. *See* Manitoulin Island.

Duck Island. *See* Manitoulin Island.

Hensley Bay. *See* Manitoulin Island.

Misery Bay. *See* Manitoulin Island.

Murphy Harbor. *See* Manitoulin Island.

Portage Bay. *See* Manitoulin Island.

Sprigley Bay. *See* Manitoulin Island.

Dominion Bay. *See* Manitoulin Island.

Square Bay. *See* Manitoulin Island.

Lougheed Bay. *See* Manitoulin Island.

Lonely Bay. *See* Manitoulin Island.

Dean Bay. *See* Manitoulin Island.

Providence Bay. *See* Manitoulin Island.

Michael Bay. *See* Manitoulin Island.

South Bay or Manitoulin Gulf, and South Baymouth. *See* Manitoulin Island.

Thomas Bay. *See* Manitoulin Island.

Cove Island Harbor. *See* Cove Island.

Tobermory Harbor. *See* Tobermory.

III.—EAST SHORE, FROM CAPE HURD TO ST. CLAIR RIVER.

Southampton Harbor. *See* Southampton.

Inverhuron. *See* Inverhuron.

Goderich. *See* Goderich.

Goderich to Sable River; the clay banks extending along this part of the coast make good holding ground.

Cape Ipperwash. *See* Cape Ipperwash.

Point Harris to head of St. Clair River; generally good holding ground.

ALASKA BAY, MICH. At the extreme end of Pointe aux Barques, Mich., and about 2 miles east of Port Austin, Mich.; a small indentation, protected on the west by Port Austin Reef, and on the east by many rocky shoals. A summer resort called Pointe aux Barques is located on the south and west shores of this bay, with one old dock nearly in the center. There is a life-saving station and good mail facilities. To enter here get the light-keeper's dwelling, which is a double brick and situated on the west point of the bay, to bear due south, running in thus until the door of the life-saving station is in range with the west side of dock, and bearing SSE., when haul sharp on this range, carrying a

uniform depth of 4 fathoms. The dock, which has 14 feet of water, is only fit for small boats to tie to. The anchorage is fair, being composed of clay and gravel.

Charts: Saginaw Bay; Lake Huron.

ALGOMA MILLS, ONT. On North Channel, Lake Huron. A principal station of the Canadian Pacific Railway. There is at this point a substantial wharf with 14 feet depth, a sawmill owned by the Canadian Pacific Railway, a post office, and a telegraph office. Almost daily communication by steamer with Sault Ste. Marie, Collingwood, and Owen Sound. Lally Point, 1 mile WSW., shelters the wharf except in heavy westerly winds, when considerable swell is felt on the weather side.

ALPENA HARBOR, MICH. U. S. Weather Bureau station; flagstaff, Bolton Building, corner Fletcher and Dock streets; electric lights. *March 1, 1901.*—The dredged channel, from Thunder Bay up to the steamboat docks at Alpena, has an available depth of 15 feet at the stage of water now prevailing. To enter here, get the brown open-framework tower, which is situated on the north side of the entrance and exhibits a fixed red light, to bear NW. $\frac{1}{4}$ W.; leaving it on the starboard hand, steer through the center of river, which has an average width of 150 feet, and an available depth of 15 feet.

Charts: Thunder Bay; Lake Huron.

AU SABLE, MICH. The original depth at the mouth of Au Sable River was $5\frac{1}{4}$ feet. There was a 10-foot channel from the mouth of the river to Au Sable swing bridge, with a width of 120 feet across the bar, but the improvement was temporary and the channel has now filled up to 4 feet. Shipments from this port are principally made from private piers built into the lake, entirely outside of the river. There is a fixed red light 32 feet above the lake level and visible $9\frac{1}{4}$ miles, on the outer end of the north pier at the mouth of the river. A shoal $\frac{1}{2}$ mile long and with 13 feet depth has formed 1 mile east of the mouth of the river. Au Sable Point (sometimes called "Fish Point") affords good holding ground and protection from all but northeast through east to southwest winds. In approaching this harbor from the southward, great caution should be exercised, as the foul ground between here and Point au Sable makes it unsafe to approach the shore nearer than 3 miles.

The steamer *Baltimore*, wrecked May 24, 1901, lies 2.81 miles S. by E. $\frac{1}{4}$ E. from Au Sable pierhead light, in 22 feet of water, and with 14 feet of water over it. The wreck is now marked by a spar buoy. The wreck of the tow barge *Thomas P. Sheldon* lies about $\frac{1}{4}$ mile northwest of the wreck of the *Baltimore*.

Chart: Lake Huron.

BAY CITY, MICH. *See Saginaw River.*

BAYFIELD SOUND, ONT. *See Manitoulin Island.*

BURNT ISLAND HARBOR, ONT. *See Manitoulin Island.*

CAPE IPPERWASH, ONT. A dangerous ledge extends to the north and northwest, with a least depth of 4 feet 1 mile from the cape, and 12 to 16 feet at the outer extremity $1\frac{1}{4}$ miles from the cape. This reef continues southwest along the shore to within $2\frac{1}{4}$ miles from Point Harris, with shoal water $1\frac{1}{4}$ miles from shore. The bight east of Cape Ipperwash has excellent holding ground in depths of 4 to 6 fathoms, with clay bottom, affording protection from all but northwest, through north to northeast winds.

Charts: South End of Lake Huron; Lake Huron.

CAPE ROBERT, ONT. See Manitoulin Island.

CHEBOYGAN HARBOR, MICH. Original depth, 6 feet. *March 1, 1901.*—Available depth at present stage of water, 18 feet in channel, 200 feet wide from Straits of Mackinac to a point 2,500 feet south of the end of McArthur's lumber dock; thence 120 feet wide, and 14 to 16 feet deep to Baker's steamboat landing. Cheboygan Shoal, $\frac{1}{2}$ mile NNE. $\frac{1}{4}$ E. of Cheboygan light, has a depth of only 14 $\frac{1}{2}$ feet; it is marked by a second-class black nun buoy moored on the northern side of the shoal in 16 feet of water. Shoal water extends out $\frac{1}{2}$ to $\frac{3}{4}$ mile from the east of Cheboygan light through north around into McLeod or Duncan Bay, in which there are many shoal spots. A bar extends $\frac{1}{4}$ mile off the east side of this bay, leaving a narrow navigable channel leading WNW. from Duncan dock to South Channel, Straits of Mackinac. The dock at Duncan is in good condition. There is a 10-foot patch $\frac{1}{2}$ mile NW. by W. from Cheboygan crib light, and a 3-foot rock, 1 $\frac{1}{2}$ miles NW. by W. $\frac{3}{4}$ W. from the same light, is $\frac{1}{2}$ mile from shore. There is a special storm-warning display station at Cheboygan; flagstaff at foot of Main street, 40 yards from steamboat dock. To enter here from the southward, continue on course from Poe Reef light ship, until the red ranges in Cheboygan are closed, when haul sharp around and steer in on ranges, heading SSW. $\frac{1}{4}$ W., passing the fixed red light on Cheboygan crib, which is outside the harbor entrance, close-to. In approaching from the north, simply look clear of the crib light, leaving it to starboard while hauling around onto ranges.

Charts: Straits of Mackinac; North End of Lake Michigan; Lake Huron; Lake Michigan.

COCKBURN ISLAND, ONT. At the north end of Lake Huron, between False Detour Channel and Mississagi Strait. It is about 10 miles in diameter and easily distinguishable by a broad and partly cleared hill, 480 feet high, situated 2 $\frac{1}{2}$ miles back from Tolsmaville, and called McQuaigs Hill. At Tolsmaville there is a custom-house officer, a post office, and two wharves; the eastern wharf is private property, the other belongs to the Government; depth at the latter, 18 feet. In a northerly gale considerable sea heaves in at both wharves. Owen Sound and Collingwood steamers land here twice a week. Vessels running out of Lake Huron in heavy weather find anchorage in 7 or 8 fathoms in Tolsma Bay $\frac{1}{2}$ mile west of the public wharf. Thompson Point, the most northerly projection on Cockburn Island, is low and wooded and may be approached within 150 yards. Foul ground extends eastward from Thompson Point with rocky patches of 3 $\frac{1}{2}$ fathoms, the outer one being $\frac{1}{2}$ mile offshore. The Magnetic Reefs off the southeast side of Cockburn Island and at the western entrance to Mississagi Strait extend 2 $\frac{1}{2}$ miles southeasterly from Boom Point and 3 miles into the straits. The southeast entrance point to Mississagi Straits is marked by Mississagi light on Manitoulin Island, 46 feet above the lake level, fixed white, visible 15 miles, with steam fog whistle, giving blasts of 8 seconds, with intervals of 2 minutes, serving to guide vessels through the straits.

Chart: Lake Huron.

CLAPPERTON CHANNEL, ONT. See Manitoulin Island.

COLLINGWOOD HARBOR, ONT. This harbor is formed by piers extending from the shore; the east pier is 1,100 yards and the west pier 800 yards in length, inclosing about 300 acres, but not more than one-fourth of the area is of any use to vessels of even moderate draft. Only a narrow lane (about 200 yards) on

the east side is deep enough for use. Entrance between piers, 225 yards. There is a dredged channel 200 feet wide and 12 feet deep, marked (entering) by red spar buoys to starboard and black spars on the port side. On the eastern extremity of the west pier there is a fixed red light 41 feet above the water visible 9 miles along all lines of approach. On a pier near the middle of the harbor at an elevation of 27 feet there is a fixed red light visible 7 miles. There is no room for anchorage and vessels must tie up to the various wharves. Work is in progress to deepen the harbor and entrance channel to 20 feet at low water. There are at this point life-saving and storm-signal stations, and a dry dock 325 feet long, 60 feet wide, and with a depth of 10½ feet on the sill at low water of 1896.

COLPOYS, ONT. *See Wiarton.*

COLPOYS BAY, ONT. *See Wiarton.*

CORSICA SHOAL. *See South End of Lake Huron.*

COVE ISLAND, ONT. Cove Island Harbor has a perfectly sheltered anchorage (which may be entered by boats drawing less than 12 feet) with depths of 15 to 18 feet, muddy bottom.

Charts: Coast Chart No. 7, Lake Huron; Lake Huron.

DEAN BAY, ONT. *See Manitoulin Island.*

DETOUR, MICH. A special storm-warning display station; flagstaff at coal chute, Pickands, Mather & Co.'s dock. To enter here, get Frying Pan and Pipe Island, both red lights, in range, and run in on same, heading N. ½ W. until within 1 mile of Frying Pan Island, when haul off to the eastward, passing the island about 1,200 feet distant.

There is a peculiar characteristic to this fog signal; during foggy weather on the lake, when it is clear in the river, the signal is sounded thus: Blast 8 seconds, silent 2 seconds, blast 8 seconds, silent 47 seconds. But when the fog is general, the signal is sounded thus: Blast 8 seconds, silent 52 seconds, blast 8 seconds, silent 52 seconds.

Charts: Straits of Mackinac; St. Marys River No. 1; Lake Huron.

DETOUR REEF. *See Dangers—III (a).*

DOMINION BAY, ONT. *See Manitoulin Island.*

DRUMMOND, MICH. *See Drummond Island.*

DRUMMOND ISLAND, MICH. This is the most easterly island of the upper peninsula of Michigan. It is 20 miles long, 12 miles wide, and bounded on the east by False Detour Channel, on the northeast by North Channel, on the northwest by Potagannissing Bay, on the west by Detour Passage, and on the south by Lake Huron. The south coast of the island is indented by many bays forming natural harbors with 4 to 7 fathoms of water. The largest bays are Whitney Bay (Port Collier, and old Fort Drummond), Island Harbor, Huron Bay, and Scammon Cove; these are natural harbors with from 4 to 7 fathoms of water, with clay and rock bottom; Scammon Cove has fine holding ground in clay. The south shore of this island abounds in reefs and dangerous rocks and strangers should not attempt to enter these bays in foggy weather. *See Dangers—III (b).*

Drummond (population 300) is situated on Potagannissing Bay, 9 miles from Detour. There is a dock at this place, with 13 to 17 feet of water at mean lake level, a sawmill, and limestone quarries furnishing excellent building stone.

Sitgreaves Bay and Glen Cove, on the northeast coast of the island, and on North Channel, afford, in suitable winds, good anchorage in 7 and 4 fathoms of water, respectively, with mud and clay bottom.

Off Shoal Point, on the northeast coast, is Lindsay Bank with 13 feet and Humphrey Rock with 11 feet least water.

The highest point on the island is Marblehead, at the western entrance to False Detour Channel from North Channel.

Charts: St. Marys River No. 1; Straits of Mackinac; Lake Huron.

DUCK ISLANDS, ONT. *See* Manitoulin Island.

DUNCAN BAY, MICH. *See* Cheboygan.

EAST TAWAS, MICH. Population 1,736. Situated on the north shore of Tawas Bay, $1\frac{1}{4}$ miles above Tawas City, the county seat. It has an excellent harbor, protected by Tawas Point, affording secure anchorage in $3\frac{1}{2}$ to 4 fathoms at the head of Tawas Bay, in all winds excepting those from the south. There are three docks in good condition with 12 feet of water. There is a special storm-signal display station at East Tawas. Tawas Point light is an intermittent white light with red sector, $70\frac{1}{2}$ feet above the lake level, and visible 16 miles. The fog signal at Tawas Point is a 10-inch steam whistle giving blasts of 5 seconds, with silent intervals of 15 and 35 seconds. Flats extend southwest off Tawas Point and are marked by a gas buoy showing a fixed white light 10 seconds, eclipsed 10 seconds. A red spar buoy is moored in 16 feet of water to mark the northwest point of this shoal. Outside of the flats the water is good and safe with bottom generally of sand and clay.

Charts: Tawas Harbor; Saginaw Bay; Lake Huron.

FALSE DETOUR CHANNEL. *See* Dangers—III (b) and (c).

FALSE PRESQUE ISLE HARBOR, MICH. This is a secure harbor for all winds from southwest around through north to northeast, with good anchorage in 4 and 5 fathoms, clay and sand bottom. From the point at the southwest side of the harbor, flats and detached shoals extend southeasterly for 2 miles; the outer patch, with a depth of 17 feet, lies $1\frac{1}{2}$ miles offshore.

Charts: Presque Isle and Middle Island; Lake Huron.

FOOT OF LAKE HURON. *See* South end of Lake Huron.

GEORGIAN BAY AND NORTH CHANNEL. The Georgian Bay and North Channel Pilot, published by order of the Minister of Marine and Fisheries, Ottawa, is obtainable from the Department of Marine, Ottawa, also from the collectors of customs at the principal Canadian lake ports and from the Admiralty Chart Agent, Toronto, Ont.

Charts: Coast Charts Nos. 7 and 8, Lake Huron; Lake Huron.

GLEN COVE, DRUMMOND ISLAND, MICH. *See* Drummond Island.

GODERICH HARBOR, ONT. A harbor of refuge in an inclosed basin with a channel cut through the beach connecting it with deep water in Lake Huron. Dredging operations are being carried on both to enlarge the deep-water area inside the harbor and to widen the channel and approach thereto. The sides of the inner end of the channel leading into the harbor are protected by two piers extending 1,600 feet into the lake. The width between the piers is 200 feet, but the channel, with a depth of 20 feet, is only 150 feet wide inside the piers and 125 feet wide outside. The edges of this channel are marked by two red buoys

on the starboard side and two black buoys on the port side. The inner basin has a depth of 15 feet, but 18 feet can be carried south of the line joining the north pier and the large elevator, which gives an area of about 400 yards long, east and west, with a greatest width of 150 yards. Good anchorage, in clay, may be found off the piers, but none in the harbor, which has rock bottom. A storm-signal station is maintained at the lighthouse on the high bank south of the harbor. A large grain elevator, situated on the southeast side of the harbor, is the most conspicuous building in Goderich. The electric lights of the town are more conspicuous from the lake than the light shown from the main lighthouse on the high bank south of the harbor. The front range light, fixed red, 45 feet above the water and visible 6 miles, is 117 feet from the outer extremity of the breakwater. The rear range light, fixed green, 34 feet above the water, and visible 6 miles, is also upon the north breakwater and 1,533 feet S. 77° E. from the front light. The waterworks pump house, upon which the steam fog whistle is placed, had a new brick chimney added to it in 1900. The new chimney is taller than the old one, which still remains. The building is of red brick with shingled roof, is partially hidden from the northwest by storehouses, and bears S. 65° E., 1,780 feet from the outer red light. Vessels approaching Goderich harbor should not get within a mile from the shore until the present range lights are in line bearing S. 77° E. or the green light opens a little south of the red light. When about 700 feet off the north pier, so open the green light as to be from 25 to 150 feet south of the prolongation of the south face of the north pier. This will place a vessel between the spar buoys. A good mark for day use is the north corner of the large elevator exactly over the north pile on the check-water pier at the inner end of the south protection pier. Keep this range on until abreast of the green light, when change course to pass 25 to 50 feet off the check-water pier and haul up for the elevator or other wharves on the south side of the harbor. Following these directions a vessel may carry 19 feet to the elevator or the wharf on the south side of the harbor. There is a depth of 15 feet up to the wharf on the north side of the harbor, but it is used only for lumber vessels. The United States is represented by a consul. There are no dues of any kind for United States vessels. The harbor is secure from all winds and the holding ground off Goderich in 3 to 4 fathoms is excellent. The clay banks extending from Goderich to Sable River afford excellent holding ground.

Chart: Lake Huron.

GORE BAY, ONT. *See* Manitoulin Island.

GRINDSTONE CITY, MICH. Town at the entrance to Saginaw Bay, about 6 miles east of Port Austin. It has one dock, in poor repair, with 8 to 10 feet of water.

Charts: Saginaw Bay; Lake Huron.

GRAHAM SHOALS. *See* Dangers—II. Entrance to Straits of Mackinac.

GREAT DUCK ISLAND, ONT. *See* Manitoulin Island.

GREENE ISLAND HARBOR, MANITOULIN ISLAND, ONT. *See* Manitoulin Island.

HAMMOND BAY, MICH. On the northwest coast of Lake Huron, about 20 miles southeast of Cheboygan. Length, between Forty Mile Point and the point at the northwest extremity of the bay, about 6 miles, with indentation inshore of about 2 miles. This bay is free from dangers, and it affords shelter

in all winds from east to northwest through south, with fair anchorage in 4 and 5 fathoms off the mouth of Ocqueoc River, which empties into the bay. Grace is a village at the northwest end of Hammond Bay with one dock, in fairly good condition, running approximately southeast. There is a life-saving station at Forty Mile Point.

Chart: Lake Huron.

HARBOR BEACH, MICH. *See Sand Beach.*

HARLEM SHOAL. *See South End of Lake Huron.*

HARRISVILLE, MICH. On the west shore of Lake Huron, 18 miles north of Au Sable and 4 miles south of Sturgeon Point light, which is fixed white, 69 feet above the lake level, and visible 16 miles. Harrisville is the county seat of Alcona County. There are two docks at this place with 16 feet of water. A rocky shoal extends south $1\frac{1}{4}$ miles and for 1 mile offshore, with a least depth of 12 feet at mean stage.

Chart: Lake Huron.

HENSLEY BAY, ONT. *See Manitoulin Island.*

HILTON, ONT. (ST. JOSEPH CHANNEL, ST. MARY'S RIVER TO NORTH CHANNEL, LAKE HURON). The private light maintained on the wharf at Hilton, north shore of St. Joseph Island, since 1896, has been discontinued.

Chart: Lake Huron.

HONORA VILLAGE, ONT. *See Manitoulin Island.*

HURON BAY, DRUMMOND ISLAND, MICH. *See Drummond Island.*

INVERHURON, ONT. This place is 9 miles north of Kincardine. There is good holding ground at this point in depths of 4 fathoms, and protection from north, east to south winds.

Chart: Lake Huron.

ISLAND HARBOR, DRUMMOND ISLAND, MICH. *See Drummond Island.*

JANET COVE, ONT. *See Manitoulin Island.*

JULIA BAY, ONT. *See Manitoulin Island.*

KAGAWONG VILLAGE, ONT. *See Manitoulin Island.*

LEXINGTON, MICH. An open roadstead, in Sanilac County, $21\frac{1}{4}$ miles north of Port Huron. Population 619. There is a dock in poor condition with 11 feet of water. Good facilities for lake trade. Flour mills, woolen mills, knitting works, and planing mill in the village. A number of passenger and freight steamers call each week. The holding ground close to shore along the coast from Fort Gratiot light to Forestville is generally good. Clay bottom is found off Lexington and above, in depths of 4 and 5 fathoms.

Charts: South End of Lake Huron; Lake Huron.

LITTLE CURRENT, ONT. *See Manitoulin Island.*

LONELY BAY, ONT. *See Manitoulin Island.*

LOUGHEED BAY, ONT. *See Manitoulin Island.*

MACKINAC ISLAND, MICH. The city bearing this name is located on the south shore of Mackinac Island in the Straits of Mackinac. Population 665. It is a famous summer resort, and many large steamers stop. There are two landing

wharves, a coaling station, and a storm-warning display station. The harbor is open to the south and exposed to the run of quite heavy seas from easterly and westerly directions. When these conditions prevail it is always difficult, frequently dangerous, and sometimes impossible to land or lie at the wharves, or to remain at anchor in the harbor. A spit with deep water steep-to extends in a southeast direction off the southeast point of the island known as Biddle Point. A plan has been submitted to Congress for the building of two breakwaters, one on either side of the harbor, to provide shelter for landing and anchorage, and to indicate a safe course in passing through the narrow channel. There is a red gas buoy (showing a fixed red light 10 seconds, eclipsed 10 seconds) moored in 16 feet of water at the end of the spit, above described, off Biddle Point. Round Island light, bearing south 1,000 yards distant, is 53 feet above the water and shows a fixed white light flashing red every 20 seconds and visible 14½ miles. The old fort and the State park are located on the bluff north of the city.

Charts: Straits of Mackinac; North End of Lake Michigan; Lake Michigan.

MACKINAW, MICH. An incorporated village, population 564, located on Old Point Mackinac, the most northerly point of the lower peninsula of Michigan. A station on the Duluth, South Shore and Atlantic, the Grand Rapids and Indiana, and the Michigan Central railways. The first-named railway maintains car ferries to St. Ignace throughout the year to connect with the upper peninsula. The railroad piers and merchandise dock are located on the east side of the point and are protected from northwest winds only. There is anchorage for small-draft vessels ½ mile offshore, southeast of the railroad pier. Storm-signal station. The lighthouse at this place marks the turning point for the South Channel. The light is 62 feet above the water, flashes red every 10 seconds, and is visible 15½ miles. The fog signal at this place is a 10-inch steam whistle, giving blasts 5 seconds, with alternate silent intervals of 17 and 33 seconds.

Charts: Straits of Mackinac; North End of Lake Michigan; Lake Michigan.

MCLEOD BAY, MICH. See Cheboygan.

MAGNETIC REEFS, ONT. See Dangers—III (c).

MAJORS SHOAL. See Dangers—II. Entrance to Straits of Mackinac.

MANITOULIN GULF, ONT. See Manitoulin Island.

MANITOULIN ISLAND, ONT. At the north end of Lake Huron. It is about 80 miles long and 28 miles wide, and extends from Owen Channel (which divides Manitoulin Island from Fitzwilliam Island) in a northwesterly direction to Mississagi Strait (see Cockburn Island). It is bounded on the east by Georgian Bay, on the north by North Channel, and narrows on the west to Mississagi Strait. The Duck Islands group, five in number, extend 13½ miles south from the south coast of the island near its west end, and reefs called the Thibault Shoal extend southward from the shore of the island to Inner Duck Island. (See also Dangers—III d.) The following bays in which good anchorage may be found are located along the south coast: Greene Island Harbor, Michael Bay, and South Bay or Manitoulin Gulf.

Greene Island Harbor is an excellent harbor, where protection from all winds and good anchorage will be found in 4 to 6 fathoms close to the northeasterly shore of Greene Island. Purvis Reef, with a least depth of 5 feet, extends 1 mile SE. by E. ¼ E. from Lynn Point, toward the west side of Greene Island. Reefs extend from Greene Island to Manitoulin Island, the most prominent

being Mink Reef, with less than 6 feet depth. Jones Reef is a detached shoal with a least depth of 9 feet, $1\frac{1}{2}$ miles SSW. $\frac{1}{2}$ W. of Belanger Point.

Burnt Island Harbor affords fine anchorage behind the north side of Burnt Island in depths of 4 and 5 fathoms, with good holding ground and protection from all but westerly winds. Stafford Rock, with a depth of $7\frac{1}{2}$ feet and a 19-foot shoal $\frac{1}{2}$ mile from it, lies 1 and $1\frac{1}{2}$ miles, respectively, SW. by W. $\frac{3}{4}$ W., from the southwesterly point of Burnt Island. Western Duck Reef, with a least depth of $7\frac{1}{2}$ feet, lying $1\frac{1}{2}$ miles northwest of Western Duck Island, extends 1 mile in a NE. by E. direction toward Stafford Rock and the southwest point of Burnt Island.

The Western Duck Island affords, in northerly gales, a good lee in depths of 5 and 6 fathoms, within $\frac{1}{2}$ to $\frac{3}{4}$ mile offshore. Detached reefs with 10 and 12 feet depth extend $\frac{1}{2}$ mile off the north side of the island. See also Western Duck Reef, described above.

The Outer Duck and Great Duck islands afford, in the narrow channel between them, and opposite Gravel Point, good anchorage and protection from all winds. Mary Shoal, with a depth of 9 feet, Larry Rock with 13 feet, and Kitty Shoal with $10\frac{1}{2}$ feet, least depths, lie from $\frac{1}{2}$ to $1\frac{1}{2}$ miles off the southerly end of Great Duck Island. The Jennie Graham Shoal, with a least depth of $7\frac{1}{2}$ feet, lies nearly 2 miles off the south point of Great Duck Island, and in line with Mary Shoal, the easterly extremities of Great Duck Island, and the west side of Middle Duck Island. Shoal water extends from the southeasterly point of Great Duck Island in a southeast direction to the middle of the west shore of Outer Duck Island with a depth of less than 6 feet. A rocky spit extending $1\frac{1}{2}$ miles south from the southern point of Outer Duck Island has a least depth of less than 6 feet with only 13 feet at the outer extremity. Manitoba Reef, awash, lies $\frac{1}{2}$ mile off the northerly point of Great Duck Island.

The following bays on the south shore of Manitoulin Island form harbors of refuge in heavy north, northwest, and northeast gales, but strangers should be very cautious about entering on account of the many outlying dangers. See Dangers—III (d).

Hensley Bay.—Anchorage in 4 fathoms, sand and stony; Buller Reef, with a least depth of only 3 feet, lies at the westerly entrance to this bay, with a narrow spit extending due south for $1\frac{1}{2}$ miles from shore, with depths from 15 to 18 feet.

Misery Bay.—Anchorage for small craft, in 2 fathoms; reefs with scattered bowlders run in a southwesterly direction $\frac{1}{2}$ mile from Misery Point. Methuen Rock, with less than 6 feet depth, lies $\frac{3}{4}$ mile SW. by W. from Misery Point. A series of detached reefs, one called Taylor Reef, with a least depth of 13 feet, and other 15, 16, and 18 foot spots, extend in a north and south direction for $1\frac{1}{2}$ miles from the middle of Misery Bay; a 16-foot spot at the extreme southern end lies $1\frac{1}{2}$ miles SE. by S. from Misery Point. Saunders Rock, with 6 feet depth, is a detached shoal $\frac{1}{2}$ mile to the northeast of Taylor Reef and $\frac{1}{2}$ mile offshore. Frechette Bank, with a depth of less than 6 feet, lies 1 mile south of Frechette Point. Other detached spots, with 15, 16, and 19 feet, least depths, lie $\frac{1}{2}$ mile to SSE., S., and SSW. of Frechette Bank and $1\frac{1}{2}$ miles from Frechette Point.

Murphy Harbor.—Anchorage for small boats only, in depths of 10 feet.

Portage Bay.—Fair anchorage under Portage Point in 4 fathoms, stony bottom. Thistle Reef, a long and narrow spit, with a depth of less than 6 feet at its inner, and of 10 feet at its outer extremity, extends $1\frac{1}{2}$ miles in a S. by W. direction, beginning $\frac{1}{2}$ mile off the east point inclosing Portage Bay. A 10-foot spot lies

1½ miles southeast of Portage Point, and a shoal with a least depth of 15 feet is 1½ miles SSE. of the same point.

Sprigley Bay.—Excellent anchorage in 4½ fathoms, sand bottom.

Dominion Bay.—Good anchorage off Dominion Point, in 5 fathoms, sand bottom; shoal water extends ¼ mile offshore from Melville Point to Dominion Point, with two outlying 15 and 18 foot spots, 1½ miles WSW. and ¼ mile SW., respectively, from Dominion Point.

Square Bay, Loughed Bay, Lonely Bay, and Dean Bay.—Good small-boat harbors in heavy northerly winds, with depths of 2 and 3 fathoms. Loughed Reef, with a least depth of 12 feet, extends ½ mile southwest of Loughed Point, and Milton Reef, with a least depth of 6 feet, extends ¾ mile SW. by W. from Milton Point. Dean Spit, with a depth of 12 feet, extends over a half mile in a southwesterly direction from the point between Lonely and Dean bays. Shoal water in Dean Bay extends ½ mile from shore with spots of 6, 9, and 13½ foot depths, running in a SW. by S. direction along the middle of the bay.

Providence Bay.—Excellent anchorage in 3 and 4 fathoms off Simcoe Point and near the wharf. Simcoe Bank, with a depth of 12 feet, lies at the entrance to Providence Bay, and runs ¾ mile from Simcoe Point in a SSW. direction. Between Providence Point and Timber Bay, shoal water extends ¾ mile offshore with reefs and rocks awash, the Everett Reefs being the most dangerous.

Michael Bay, formed by Michael Point and Hammond Point, is landlocked on three sides, and open to the westward. It is an excellent harbor, affording anchorage in 3 to 5 fathoms, clay bottom. On Michael Point there is a fixed white light, visible 13 miles in clear weather, serving to guide vessels into the harbor. A hand horn answers fog signals. A sharp lookout should be kept when entering from the west, for Advance Reef, a detached narrow rocky shoal ½ mile in length from southwest to northeast, and with a depth of less than 6 feet, lying with its westerly end 2½ miles westward of Michael Point light. Chisholm Rock in Michael Bay has less than 6 feet of water over it and lies ¾ mile SW. ¼ W. from the wharf. From Michael Point a narrow spit with a least depth of 10 feet extends 1½ miles in a W. ¼ S. direction. The bight between Michael and Walker points is blocked by reefs extending 1½ miles from shore. Genesta Bank, with a depth of less than 6 feet, is a detached reef lying 1½ miles southeast of Michael Point light.

South Bay or Manitoulin Gulf affords protection in all winds and extends 14 miles in a northeasterly direction, forming, on its eastern side, the peninsula which terminates at its southern and southwestern extremities in Hungerford Point and McGaw Point. The greatest depth in the bay is 32 fathoms; the least depth at 800 feet from the shore is about 4 fathoms. Fine anchorage in from 4 to 7 fathoms, mud bottom, is found anywhere in the bay. The South Baymouth range lights, two fixed white lights, visible 13½ miles in clear weather, indicate the channel leading into this fine harbor, which is free from all dangers. Between Walker Point and the South Baymouth range lights and ¾ mile SE. by S. from Walker Point, lies Volunteer Spit, with a least depth of 13 feet. Red Dan Rock, nearly awash, lies ¾ mile SE. by S. from Birch Point, and Scotchie Reef, with Inkster Rock nearly awash, lies 800 yards SW. ¼ S. from Baymouth front range light and 170 yards west of South Baymouth range leading into South Bay. Another detached shoal with a least depth of 15 feet lies 300 yards east of South Baymouth range, and 1½ miles S. by W. ¾ W. from South Baymouth front light.

Thomas Bay affords protection from all winds and good anchorage in depths of $4\frac{1}{2}$ to 7 fathoms, mud bottom. A spit with a depth of less than 6 feet extends $\frac{3}{4}$ mile S. by W. from Thomas Point. Todman Reef, with a least depth of 7 feet, lies in the middle of the entrance to Thomas Bay, 1 mile E. $\frac{1}{2}$ S. from Thomas Point. Six fathoms of water can be carried through the westerly channel leading into the bay. The Grantham Shoal, with a least depth of 7 feet, and Vigilant Rock, with a least depth of 12 feet, are detached rocky reefs 1 mile offshore and near the easterly entrance to Thomas Bay. From the east entrance point of Thomas Bay to Hungerford Point the shore should not be approached nearer than $1\frac{1}{2}$ miles.

The north coast of Manitoulin Island, on North Channel, is indented by large and deep bays, all affording good anchorage and protection from all but northerly winds. The largest bays are Smith Bay, Manitowaning Bay, Sheguiandah Bay, West Bay, Mudge Bay, Gore Bay or Janet Cove, Julia Bay, Bayfield Sound, Vidal Bay, and Meldrum Bay.

Smith Bay, the most easterly, is surrounded by dangerous reefs, including Goldhunter Rock with 6 feet of water, Pelkie Rock with $7\frac{1}{2}$ feet, and Doyle Rock with 22 feet. Frank Ledge, with 5 feet of water on it, is also a dangerous spot at the north entrance. Wekwemikong, a settlement with a Roman Catholic church, is at the northwesterly head of the bay.

Manitowaning Bay, westward of Smith Bay, is a fine sheet of water 11 miles in length, clear of outlying dangers. The town of Manitowaning (population 400), pleasantly situated at the head of the bay, has almost daily communication with Sault Ste. Marie, Owen Sound, and Collingwood. The southern portion of the bight formed between Narrow Point and the town wharves is shallow, but as the wharves are approached the water deepens and good anchorage in from 3 to 5 fathoms, with mud bottom, is found between the wharves and Fanny Island. Manitowaning Light, 250 yards northerly of the Government wharf, is 80 feet above the water, and shows a fixed white light visible 16 miles.

Sheguiandah Bay is a large indentation between Manitowaning Bay and Little Current. In entering this bay, Loon Island Reef with 6 feet of water, McGregor Bank with 9 feet, and Boulton Reef with 9 feet, least depth, should be carefully avoided. Sheguiandah Village (population 421) has a public wharf, with a depth of 11 feet, and a post office.

Strawberry Island Channel (leading north from Sheguiandah Bay toward Little Current) is a passage between Strawberry Island and the neighboring shore of Manitoulin Island. If properly buoyed, 4 fathoms might be carried through. At present, with four ranges, 20 feet will be found.

Little Current occupies an important position, being situated on the south side of the narrow channel through which all vessels must pass in navigating between Georgian Bay and North Channel. This channel lies between Manitoulin and Goat islands; the western part has been excavated to a depth of 17 feet, mean stage, and a width of 150 feet. The town of Little Current has good stores and hotels, telegraph and telephone lines, wharves with ample water alongside, and daily steamboat connection with Georgian Bay ports, and with Sault Ste. Marie. There are two fixed white lights at Little Current, 450 yards apart, and visible 7 miles. The south light is near the shore between the wharves; the north light bears N. $\frac{1}{4}$ W. from the south light, and is on the east point of Spider Island. Narrow Island light, * fixed white, visible $12\frac{1}{2}$ miles, with hand fog horn,

* Temporarily discontinued.

on the west extremity of Narrow Island, marks the south entrance point of the western approach to Little Current. It may be approached to within 150 yards. There are two rocks with 6 feet depth, 400 yards west of the light.

West Bay is about 8 miles long, and its width between Wabos Island and Francis Point is 6 miles. It is a fine sheet of water with few dangers. As much as 32 fathoms of water will be found in the center of the bay, and more than 20 fathoms within 100 yards of the east shore of the southern part. There is anchorage at the head of the bay in from 6 to 8 fathoms, mud bottom.

Sounding Cove, in West Bay, affords good shelter from northerly gales, with 5 to 7 fathoms over mud bottom, within 300 yards from the north shore of the cove. Honora Village, situated on the north shore, has a small wharf with 17 feet of water. Passing northward along the west shore of West Bay to Mudge Bay, the following reefs are found: The Tooth, 8 feet above water; McRae Patch, with a least depth of 19 feet over rock, 1 mile NE. $\frac{1}{2}$ E. from Francis Point; Tache Island Reef and Shoal, a patch of dry and sunken rocks, extending $\frac{1}{2}$ mile northerly from Francis Point; and Martin Reef, composed of dry stones 2 feet above water, about $\frac{1}{2}$ mile NW. by W. from Francis Point.

Mudge Bay, separated from West Bay by Francis Point, is $3\frac{1}{2}$ miles wide between Gooseberry Island and Maple Point, and about $3\frac{1}{2}$ miles long. The depth is 6 to $8\frac{1}{2}$ fathoms, with mud bottom, making it one of the finest anchorages. The only danger is McInnes Bank, 200 yards in diameter and with 12 feet of water; it lies in the middle of the bay, 1 mile NW. by W. from Gooseberry Island. Sutherland Shoal, with a depth of 15 feet, situated about $\frac{1}{2}$ mile from the shore line extending south from Maple Point, lies about $1\frac{1}{8}$ miles northwest of McInnes Bank, and about $\frac{1}{8}$ mile NE. $\frac{1}{2}$ N. from the extremity of Sextant Point and S. by E., nearly half a mile from Little Island. Kagawong Village (population about 250) at the south end of the bay, has a wharf with 16 feet depth, a post office, a sawmill, and telephone and telegraph connection with Little Current and the Canadian Pacific Railway system. Kagawong light, fixed white, 38 feet above the water and 100 feet west of the wharf, is visible $12\frac{1}{2}$ miles.

Clapperton Channel separates Manitoulin Island from Clapperton Island, and extends from the south point of Clapperton Island and Francis Point on the east, to Courtney Island and Maple Point on the west. This channel may be navigated, in daylight and clear weather, by vessels of less than 12 feet draft.

Gore Bay or Janet Cove is $1\frac{1}{2}$ miles wide at the entrance and $2\frac{1}{2}$ miles long, gradually narrowing to a point called Town Point. It affords good anchorage in from 4 to 10 fathoms, mud bottom. The town of Gore Bay (population 472), the county seat of Manitoulin Island, has two wharves with depth of 18 feet; a telephone line connects with other villages of the island and with the Canadian Pacific Railway telegraph system. Gore Bay Light, on Janet Head, between Gore and Julia bays, is a fixed white light 43 feet above the water surface, and visible $12\frac{1}{2}$ miles.

Julia Bay is a deep, square indentation west of Gore Bay, between Janet Head and Blackstock Point, $3\frac{1}{2}$ miles broad and $2\frac{1}{2}$ miles long, with a depth of 20 fathoms $\frac{1}{2}$ mile from the head; it is unsuitable for anchorage in northerly gales.

Bayfield Sound is a large inlet sheltered from the northward by the Barrie and Henry Island group. With Wolsey Bay it forms one large harbor, about 14 miles long and $4\frac{1}{2}$ miles wide at the widest part. Heron Patch and Jubilee

port. *August 1, 1901.*—An elevator, with a capacity of 700,000 bushels, has been constructed. The Canadian Government has completed a 20-foot channel to the elevator dock. The harbor is easy of access, and, unlike Collingwood, the surrounding coast is clear of rocky islands and reefs. There is good anchorage in 5 to 8 fathoms, and protection from southeast, south, to northwest winds, with mud bottom anywhere north of the harbor to Cape Rich, $7\frac{1}{4}$ miles distant. There is a fixed white light at the outer end of the pier, 42 feet above the bay level, visible 15 miles, and a fog horn answers signals from vessels.

Chart: Lake Huron.

MELDRUM BAY, ONT. *See Manitoulin Island.*

MICHAEL BAY, ONT. *See Manitoulin Island.*

MIDDLE ISLAND, MICH. Is situated $1\frac{1}{4}$ miles from the mainland, and 5 miles southeast of False Presque Isle Harbor. It is $\frac{1}{4}$ mile long northwest and southeast, and $\frac{1}{4}$ mile northeast and southwest. It affords a lee in all winds with good holding ground on the south side at a distance of $\frac{1}{4}$ mile, in 4 or $4\frac{1}{2}$ fathoms. Flats extend $\frac{1}{2}$ mile south of the south point of the island, and for about 400 yards off the southwest side, and 400 to 700 yards off the northwest side. A shoal midway between the island and the mainland, with a least depth of 6 feet, and other patches of 16 and 17 feet depth, must be avoided. A 3 foot patch, 1,000 yards ESE. from the southeast point of the island, is marked on the eastern edge by a 2d-class red nun buoy moored in 20 feet of water. There is a life-saving station and a special weather display station on the northwest point of the island.

Charts: Presque Isle and Middle Island; Lake Huron.

MIDLAND, ONT. Situated on the southeastern arm of Georgian bay. Terminus of the main line of the Midland Division, Grand Trunk Railway. Saw, shingle, flour, woolen, and planing mills, and two large grain elevators. Steamboats ply regularly to Parry Sound, Collingwood, Byng Inlet, French River, and Algoma Mills. An excellent harbor. Outside of the Midland Railway elevators there is 20 feet of water alongside of the wharf. In the inner harbor behind the elevators small tugs and vessels may lie in a limited space, in 12 feet of water. Only vessels of light draft can get alongside the long piece of crib work, called the Esplanade, facing the harbor. Midland Bay Shoal, with 11 feet least water, marked by a red spar buoy, lies almost directly in the way of vessels making for the town of Midland, and must be passed to the eastward, keeping Present Island in sight, east of Midland Point, and bearing NNE. $\frac{1}{4}$ E., magnetic. A rock with 17 feet of water on it lies W. by S. 1,050 feet from Midland Bay Shoal. Two range lights, established by the Government of Canada in the town of Midland, Georgian Bay, Ontario, were put in operation for the first time November 21, 1901. The lights are fixed red, incandescent electric, shown from lamps on electric-light poles, on the hill in the southwest part of the town. The front light is elevated 30 feet above the ground and 150 feet above the water level of the harbor. The front pole stands on the hillside, 100 feet north of Ottawa street, between Seventh and Eighth streets. The back range light stands on Ottawa street, 1,320 feet S. 56° W. from the front light. The light is elevated 30 feet above the ground and 190 feet above the water level of the harbor. The two lights in one, bearing S. 56° W., lead in from Midland Point up to the wharves in the harbor, clear to the southeastward of Midland Bay Shoal.

Chart: Lake Huron.

MISERY BAY, ONT. *See* Manitoulin Island.

MISSISSAGI STRAIT, ONT. *See* Cockburn Island, and Dangers—III (c) and (d).

MUDGE BAY, ONT. *See* Manitoulin Island.

MURPHY HARBOR, ONT. *See* Manitoulin Island.

NARROW ISLAND, ONT. *See* Manitoulin Island.

NORTH POINT, MICH. The easterly extremity of the mainland on the north shore of Thunder Bay. A shoal sets out for $1\frac{1}{2}$ miles in a SSE. direction with only 12 feet of water at mean stage; the extreme south end is marked by a red gas buoy, fixed white light 10 seconds, eclipsed 10 seconds, moored in 22 feet of water, and marking the turning point for vessels bound northward out of Alpena and Thunder Bay, making for Thunder Bay Island.

Charts: Thunder Bay; Lake Huron.

NORTHWEST SHOAL. *See* South End of Lake Huron.

OSCODA, MICH. A village (population 1,109) directly north of and adjoining the city of Au Sable. An open roadstead with a good dock at which all regular shore steamers stop. The principal exports are lumber, lath, and shingles. This is a storm-signal display station. *See also* Au Sable.

Chart: Lake Huron.

OSSINEKE, MICH. *See* Thunder Bay.

OUTER DUCK ISLAND, ONT. *See* Manitoulin Island.

OWEN SOUND, ONT. A town (population 7,497, including the adjoining village of Brooke) located at the head of Owen Sound, south end of Georgian Bay. The harbor has been enlarged and deepened to a uniform width of 300 feet and depth of 20 feet, at Canadian Survey datum, by cutting away the point on the west side and sheet-piling the edge. The dredged entrance channel is 100 feet wide and its edges are marked by spar buoys. The Sydenham and Potawatamie rivers enter Owen Sound at this point, the latter 300 yards westward of the former. There is a dry dock with dimensions of 300 feet over all, and width of 55 feet at the gate, but with a depth over the sill of only 10 feet at mean stage. The Grand Trunk Railway station and yards are on the west side of the harbor just south of the dry dock. This place is the terminus of the Lake Superior line of steamboats of the Canadian Pacific Railway, and that company has two large elevators on the east side of the harbor, the most conspicuous objects seen in approaching. Both railroads have substantial shipping docks. The Maitland and Rixon sawmills have built toward the bay two long wharves, at which there is 13 feet of water. In a heavy northeast gale good anchorage can be found off the Findlay Mill, in 6 to 7 fathoms of water, with mud bottom. There is a storm-warning display station on the west side of the harbor near its inner end. There are range lights at the harbor entrance; the front light, fixed red, 39 feet above the water surface, is visible 8 miles; the rear light, fixed red, 46 feet above the water surface, is visible $9\frac{1}{4}$ miles.

Chart: Lake Huron.

PARRY SOUND, ONT. A town (population about 3,000) divided into two portions; the part eastward of the Seguin River (which empties into Parry Sound at this point) is called Parry Harbor. The entrance to the harbor is between Deepwater and Bobs points, with a width of 250 yards, which for large-draft vessels is contracted one-half by a bank extending from Bobs Point. The

western edge of this bank, marked by a black buoy, has a depth of 11 feet over rock. The depth in the channel close to Deepwater Point is 4 fathoms. The harbor comprises about 370 acres, and $1\frac{1}{4}$ miles of wharfage has been built. A draft of 15 feet can be carried to the Parry Sound Company's wharf. There is a rock usually marked by a buoy, with 10 feet depth of water, 200 yards from the eastern shore of the harbor and W. by S. $\frac{1}{4}$ S. 300 yards from the wharf at Parry Harbor. Storm-warning display station. A small pinnacle rock, with 16 feet of water on it, has been discovered in the neighborhood of Black Rock, in the entrance to Parry Sound, where the steamer *Arthur Orr* struck May 3, 1901. The rock lies S. $8^{\circ} 30'$ W., 2,500 feet from Black Rock beacon, and 450 feet N. E. of Jones Island range. It has been marked by a black buoy. Masters of vessels using this channel should keep the lights exactly in line, and reduce their speed between Red Rock and Carling Rock.

Chart: Lake Huron.

PENETANGUISHENE, ONT. Population about 2,500. The northern terminus of the Northern and Northwestern Division of the Grand Trunk Railway. Flour, saw, and planing mills, a tannery, and a foundry furnish the chief industries. The Ontario Reformatory for boys is located on elevated grounds on an old military reserve. There is an excellent harbor, $2\frac{1}{4}$ miles long north and south, and $\frac{1}{4}$ mile wide for anchorage, with depth of $3\frac{1}{2}$ to 5 fathoms, mud bottom, and protected from all winds. The South Basin, extending south from Davidson's and Beck's sawmills, is shallow, with 12 to 16 feet of water. Whisky Island light, in the outer harbor, fixed white, visible $12\frac{1}{4}$ miles, and Reformatory pier light, fixed white, visible $9\frac{1}{4}$ miles, form a range (S. 56° W. magnetic) for entering the harbor by a contracted channel between Northwest Point and Reformatory Point, with a depth of 5 fathoms. Sandy flats, at intervals, extend 150 to 300 yards from the east side of the harbor. Northeast Shelf makes out 300 yards from the shore at the northwest side of the Reformatory grounds. The protruding spits of this shoal have been dredged to a depth of 17 feet, with a width of 300 feet to straighten the entrance channel above mentioned. A flat extends from the east shore of the harbor to Magazine Island, and its west edge off the island is marked by a black spar. Middle Shelf, off the tannery, has a depth of but 3 feet $\frac{1}{4}$ mile northwest from the end of the tannery dock. Allen Shelf, with a least depth of 3 feet, lies off the town and close alongside of the dredged channel, $\frac{1}{4}$ mile N. $\frac{1}{4}$ W. from the Esplanade, the town wharf, which has 12 feet of water. Good anchorage, in 5 to 7 fathoms of water, with mud bottom, and protection from all winds, is found in that part of the outer harbor known as Black Bay, situated north of the Reformatory pierhead light, and southwest of Sloane Point. A flat extends about $\frac{1}{4}$ mile off the south point of Whisky Island in the outer harbor. To pass between Whisky Island and Sloane Point keep the northernmost Indian huts on the west shore of the harbor in line with the Reformatory light, SW. $\frac{1}{4}$ W. At the two sawmill wharves and at the Summer Hotel wharf, vessels drawing 12 feet may load. The tannery wharf has only 9 feet.

Chart: Lake Huron.

POE REEF. *See Dangers—II. Entrance to Straits of Mackinac.*

PORTAGE BAY, ONT. *See Manitoulin Island.*

PORT AUSTIN, MICH. An incorporated village of 507 inhabitants, on the Pere Marquette Railroad and on the south side of the entrance to Saginaw Bay; it

lies on the shore of a shallow bay between Flat Rock Point and Pointe aux Barques, a summer resort situated $2\frac{1}{2}$ miles northeast. There are two piers with 9 to 10 feet of water. The principal shipments are grain, hay, fruit, fish, and stone. Port Austin Reef light is on a reef extending northwest $1\frac{1}{2}$ miles from Pointe aux Barques. The light is fixed white, flashing red, 80 feet above the lake level, and visible $16\frac{1}{2}$ miles. There is a 10-inch steam fog whistle at this light, giving blasts of 7 seconds with silent intervals of 80 seconds. A black can marks a reef with 12 feet depth, $\frac{3}{4}$ mile NNW. of the light extending $\frac{1}{4}$ mile east and west. Vessels should not pass inside of this buoy. There is a special storm-warning display station at Pointe aux Barques.

Charts: Saginaw Bay; Lake Huron.

PORT ELGIN, ONT. On the east coast of Lake Huron, in a bight 4 miles south of Chantry Island. A reef extends northward $1\frac{1}{2}$ miles from the point west of Port Elgin. The south range front light is a fixed white light 16 feet above high-water mark, and visible 4 miles; it is located on shore, at a point 1,200 feet S. 7° E. from the south end of the Government wharf. The south range rear light is a fixed red light, 20 feet above high-water mark, and visible 5 miles. It is located at a point 70 feet S. 70° E. from the front light. The north range front light is a fixed white light, 21 feet above high-water mark, and visible 10 miles. It is on the northern extremity of the Government wharf. The north range rear light is a fixed red light, 31 feet above high-water mark, and visible 5 miles. It is located on shore, at a point on the east side of the harbor, N. 36° E. 660 feet from the front light. To enter the harbor, bring the south range lights into one, and stand in until the north range lights are brought in line. Follow this range into the dredged harbor between the breakwater and the landing wharf, leaving the front light on the starboard hand to clear the wharf.

Chart: Lake Huron.

PORT HOPE, MICH. Formerly called Stafford, is 7 miles north of Harbor Beach on the shore of Lake Huron. It has one dock in good condition. There is 10 feet of water over the bar.

Charts: Saginaw Bay; Lake Huron.

PORT SANILAC, MICH. On Lake Huron, 30 miles above Port Huron. It has one dock with 10 feet of water. There is a fixed red light, 69 feet above the water, visible 13 miles.

Charts: South End of Lake Huron; Lake Huron.

PRESQUE ISLE, MICH. A safe but limited harbor and anchorage for small vessels in 3 and $3\frac{1}{2}$ fathoms. A bar with a depth of $13\frac{1}{2}$ feet at the present stage closes the harbor. Vessels can carry 13 feet in range with the range lights on the west shore of the harbor. Inside the bar there is an area of about 60 acres with a depth of 20 feet. Range lights indicate the channel into the harbor on W. $\frac{1}{2}$ N. course. The front light is fixed white, 18 feet above the water; the rear light is fixed white, 36 feet above the water. A 9-foot shoal extends 1,000 yards E. by S. from the old light tower, with 15 feet extending 200 yards south-eastward. A coast light, fixed white, 123 feet above the water and visible $19\frac{1}{2}$ miles, is located about 1,500 feet from the north end of Presque Isle peninsula; it marks the turning point for the Straits of Mackinac. There is a 10-inch steam whistle for a fog signal, on the beach, $\frac{1}{4}$ mile N. by W. from the light, giving blasts of 5 seconds with silent intervals of 25 seconds. The bay west of the peninsula affords shelter and anchorage in easterly and southerly winds, but the bottom is rock. There is a special storm-signal display station here.

There is a 14-foot shoal in the middle of the bay (S. 45° W. of Presque Isle light with 5 and 6 fathoms around it.

Charts: Presque Isle and Middle Island; Coast Chart No. 8, Lake Huron; Lake Huron.

PROVIDENCE BAY, ONT. See Manitoulin Island.

RAYNOLDS REEF. See Dangers—II. Entrance to Straits of Mackinac.

ROGERS, MICH. Population 544. The county seat of Presque Isle County. Situated between Forty Mile Point and Presque Isle Harbor, and near the mouth of Trout River. Has steam saw and planing mills, and three piers 500 feet apart, with 13 to 16 feet of water, from which lumber, cedar posts, railroad ties, grain, hay, and general farm products are shipped in large quantities. There is a reef outside with 11 feet of water. Telephone line to Alpena. The coast light at Forty Mile Point is 6½ miles NW. ¼ W. from Hoeft Dock. Forty Mile Point light is 66 feet above the level of the lake, flashes white every 10 seconds, and is visible 15½ miles; a 10-inch steam fog whistle, placed about 290 feet SE. by E. ¼ E. from the light tower, gives blasts of 3 seconds, silent intervals 17 seconds.

Chart: Lake Huron.

SAGINAW BAY, MICH. The anchorage is generally good in all parts of the bay excepting around Charity Islands, where it is rocky. There is good holding ground with protection from all northerly and westerly winds close under the land around Gravelly Point, in depths of 4 to 5 fathoms with mud bottom. Tawas Bay is a natural harbor of refuge; there is good anchorage at its head in depths of 3½ to 4 fathoms. At Au Sable Point (sometimes called Fish Point) there is good holding ground, with protection from southwest through north to northeast winds.

The dangers in this bay, beginning at Port Austin Reef light and passing around the shore to Au Sable Point, are as follows: Pointe aux Barques Reef reaches northwest 1½ miles from the mainland and extends beyond Port Austin Reef light. Seven-eighths of a mile NNW. of this light there is a reef, with a depth of but 11 feet at mean stage, running in an east and west direction for nearly ¼ mile. It is marked by a 2d-class black can buoy, No. 3, moored in 16 feet of water. West of Pointe aux Barques there are flats extending offshore, reaching out about ¼ mile from the wharf at Port Austin and continuing at about that distance from shore around Flat Rock Point and along the coast to Port Crescent. A shoal with depths of but 5 to 8 feet lies with its south end about 1½ miles NW. by N. from the wharf at Port Crescent and runs thence about N. by W. 1 mile. South of this shoal, in the bay northwest of Port Crescent, there is good water. About 2 miles west of Port Crescent and 1 mile east of Hat Point, a spit with a depth of but 5 feet extends nearly due north, about 2 miles from shore, and at Hat Point a spit with a depth of but 3 feet extends northerly ¼ mile, with a 14-foot spot outside, and about 1½ miles from Hat Point. About halfway between Hat Point and Oak Point a rocky shoal extends 1½ miles from shore with a least depth of 16 feet at its end, and 4 feet, ¾ of a mile from shore. From Sand Point a sand bar puts out in a northwest direction for 1½ miles with a least depth of 1 foot, and a sand bank, with a 9-foot channel crossing it, extends to Little Charity Island. Charity and Little Charity Islands are surrounded by flats extending about 2 miles in all directions. The northwestern edge is marked by a black can buoy 2½ miles NW. by W. ¼ W. from Charity Island light. There is a rocky spot with only 1 foot depth about 1½ miles south-east of Little Charity Island. From Sand Point around to Point aux Gres the

whole east, south, and west shores of Saginaw Bay are filled by a flat, which, from the eastern shore, extends out 10 miles before reaching a depth of 17 feet; on the southern shore, off the mouths of the Saginaw and Kawkawlin rivers, the depth of 17 feet is $3\frac{1}{2}$ miles offshore, and on the western shore, off the mouths of the Pinconning and Pine rivers, the flat sets out from $4\frac{1}{2}$ to 7 miles. There are sand spots, with depths of 5 and 8 feet, $4\frac{1}{2}$ and $5\frac{1}{2}$ miles NW. by N. and NNW. off the mouth of the Quanicassee River. There is a shoal with 16 feet of water extending 1 mile in an east and west direction, with its west end NNE. $4\frac{1}{2}$ miles from the front range light at the mouth of the Saginaw River. A stony ledge with depths of 3 to 6 feet extends 3 miles east from the mouth of the Pinconning or Potato River. A sand spit with depths of 3 to 6 feet extends E. by S. about 4 miles from the mouth of the Saganin River, and a spit with a depth of 4 feet extends about $2\frac{1}{2}$ miles SE. from the mouth of Rifle River. There is a rocky spit with a depth of 7 feet 1 mile east of Point aux Gres, and a flat extends $1\frac{1}{2}$ miles off the mouth of Aux Gres River. A dangerous 11-foot shoal extends $1\frac{1}{2}$ miles ESE. from Gravelly Point, and a 16-foot spot SE. by E. $2\frac{1}{2}$ miles off this point is marked by a gas buoy moored in 18 feet of water, giving a fixed white light 10 seconds, eclipsed 10 seconds. There is a 5-foot shoal $\frac{1}{4}$ mile southeast of Whitestone Point. Shoal water, with 11 feet depth, extends 1 mile off Alabaster Dock. A flat extending southwest and northwest from Tawas Point $\frac{1}{4}$ of a mile, is marked on its southwesterly edge by a gas buoy moored $\frac{1}{4}$ of a mile from the flat in 33 feet of water, and on its inner or northwestern edge in Tawas Bay by a red spar buoy. The shore between Tawas Point and Au Sable Point (sometimes called Fish Point) should not be approached within 1 mile. There is shoal water around Au Sable or Fish Point extending out for a distance of $\frac{1}{4}$ mile.

Charts: Saginaw River; Saginaw Bay; Tawas Harbor; Lake Huron.

SAGINAW RIVER, MICH. Original depth at entrance, 8.5 feet. *March 1, 1901.*—Available depth of channel across the bar at the mouth is 15 feet; its width, 200 feet, from the 16-foot curve in Saginaw Bay to about 1 mile north of the front light of the Saginaw River range; thence 150 feet wide to the deep water in the river. From the mouth of the river to the Portsmouth bridge at Bay City there is 13 feet, and from there to the city of Saginaw, 11 feet. Logs, floating partly submerged, makes this a dangerous harbor for propellers to enter at night. There is a special storm-warning display station at Bay City; flagstaff at 1011 Water street.

Charts: Saginaw River; Saginaw Bay; Lake Huron

ST. IGNACE, MICH. Population 2,271. Situated on East Moran Bay, Straits of Mackinac. Terminus of the Duluth, South Shore and Atlantic Railway, and connected by railroad-transfer car ferry the whole year with the Michigan Central and the Grand Rapids and Indiana railways at Mackinaw. There are docks with good water, from which fish, lumber, square timber, cedar ties, posts, and poles are extensively shipped.

Charts: Straits of Mackinac; North End of Lake Michigan; Lake Michigan.

ST. MARTIN BAY, MICH. (ABOUT 7 MILES NORTH OF THE ISLAND OF MACKINAC, STRAITS OF MACKINAC). The depth is 4 to 6 fathoms to within 1 mile of the shore, excepting off the mouths of Carp and Pine rivers, where sandy flats extend out 1 mile to $1\frac{1}{2}$ miles.

Charts: Straits of Mackinac; North End of Lake Michigan; Lake Michigan.

SAND BEACH (HARBOR BEACH), MICH. This is an artificial harbor of refuge, affording good anchorage and protection from all winds. The harbor works comprise three separate piers or breakwaters, so located as to cover the sheltered area on the north, northeast, and east sides. The northerly one, called the west pier, starts in shallow water 750 feet from the shore line, and extends about ESE. for a distance of 1,503 feet. The main pier commences 300 feet eastward of the end of the west pier, extends in a southeasterly direction 4,675 feet, and bears the brunt of northeasterly gales. The south pier commences 600 feet south of the southerly end of the main pier and extends 1,956 feet on a north and south line. This arrangement provides an entrance 300 feet wide from the north and one 600 feet wide from the east. There is an uncovered interval of 2,200 feet extending from the south end of the breakwater system to the shore line, but the depth of the water there is so small that the seas raised by the southeasterly gales are much broken on entrance, so that effective shelter can be found in the northeasterly portion of the harbor when such storms prevail. These breakwaters inclose an area of about 650 acres, in 119 acres of which the depth of water is 20 feet or more. This is a special storm-warning display station; steel tower on high ground near F. & P. M. Railway depot.

March 1, 1901.—The east and north entrances to the harbor of refuge have both been dredged to 21 feet below zero of gauge, but with the prevailing stage of water the available entrance depth is not over 19.5 feet; equal or greater depth adjoins the breakwater inside at all points between these two entrances. Vessels can reach the steamboat wharf on a draft of about 12 feet at the present stage of water.

RULES AND REGULATIONS for the government of the HARBOR OF REFUGE AT SAND BEACH, as prescribed by the Secretary of War in accordance with the provisions of an act of Congress approved June 19, 1882:

First. All boats, barges, and vessels entering the harbor will be required to take such positions as may be assigned them by the *custodian*, who will direct their movements, either from the breakwater or from the Government steam launch on the harbor.

Second. In the absence of any directions as to position, boats, barges, and vessels entering the harbor will observe the following general rule: All steam craft will, when practicable, make fast directly to the snubbing posts in the breakwater. Sailing craft will so locate themselves that they will not lie in the way of other vessels entering the harbor, or in any way interfere with the work of construction or repairs that may be in progress at the time.

Third. The use of chains in making fast to the breakwater will not be permitted, lines must be attached to the snubbing posts only, and out-board anchors taken in.

Fourth. Steam craft with barges or vessels in tow will, if practicable, at once place them compactly alongside the breakwater, either taking in the tow lines entirely, or passing them on the breakwater, so as not to interfere in any way with the landing or departure of boats or vessels between them. If impracticable to place them alongside the breakwater, they will each drop anchor and at once take in all tow lines extending from one to the other.

Fifth. Passenger boats will in general have the preference as to location and attention by the custodian. Rafts will give away to all documented craft.

Sixth. All classes of boats, barges, vessels, or other floating property making fast to the breakwater, must at once place such fenders between themselves and the breakwater as may be thought necessary by the custodian to prevent chafing or other damage.

Seventh. The unloading of wood, coal, ballast, stone, or freight of any class upon the breakwater is expressly prohibited, except in certain cases allowed by special permission from the custodian.

Eighth. Each and every piece of floating property made fast to the breakwater, or anchored in the harbor, must keep out-board from sunset to sunrise a conspicuous white light, and must have upon it, or in immediate charge of it a watchman during the entire time such floating property is in the harbor. All colored lights must be at once taken in, or covered, on dropping anchor or making fast to the breakwater.

Extract from act of Congress, approved June 19, 1882.

SEC. 3. That it shall be the duty of all persons using or navigating said harbor, its channels and approaches, or using any of the piers, breakwaters, docks, wharves, or other improvements made by the United States, to observe the regulations prescribed by the Secretary of War, as aforesaid; and any person who shall willfully or negligently strand or sink any steam vessel, boat or craft in said harbor, or in the channels or approaches, or who shall willfully obstruct or oppose the custodian of said harbor in the enforcement of the regulations aforesaid, or who shall willfully or negligently, or by failure or neglect to observe the regulations prescribed by the Secretary of War for the use thereof, obstruct or impair said harbor, or cause any impediment, injury, filling up or shoaling therein, or shall deposit any earth, ashes, stone, ballast, or other substances in said harbor, channels or approaches tending to obstruct or impair the navigation thereof, or who shall willfully damage or injure the piers, breakwaters, wharves, docks or other improvements of said harbor made by the United States, or who shall fail to obey and observe any of said prescribed regulations, shall be liable to a penalty of not less than fifty dollars nor more than five hundred dollars.

Charts: Sand Beach Harbor of Refuge; Saginaw Bay; Lake Huron.

SCAMMON COVE, DRUMMOND ISLAND, MICH. *See* Drummond Island.

SERBEWAING HARBOR, MICH. *March 1, 1901.*—Present available depth on the outer bar, about 5 feet, and near the mouth of the river, about 6 feet; work of dredging a channel with a navigable depth of 8 feet in progress.

Charts: Saginaw Bay; Lake Huron.

SHEGULANDAH, ONT. *See* Manitoulin Island.

SHEGULANDAH BAY, ONT. *See* Manitoulin Island.

SITGREAVES BAY, DRUMMOND ISLAND, MICH. *See* Drummond Island.

SMITH BAY, ONT. *See* Manitoulin Island.

SOUNDING COVE, ONT. *See* Manitoulin Island.

SOUTHAMPTON HARBOR, ONT. At the mouth of Saugeen River, east of Chantry Island. The harbor is formed by two breakwaters—one, 1,600 feet long, extending easterly from the old breakwater at the northern end of Chantry Island; the other, 2,000 feet long, curving from the mainland to within 400 feet of the end of the breakwater extending from Chantry Island. There is a landing pier in the inner harbor. The depth of the channel leading into this harbor is about 14 feet at mean stage. Range lights, fixed red and fixed white, lead to the opening in the breakwater at the north end of the harbor. The rear light must be opened east of the front light to clear the shoal running out from the north end of Chantry Island. Saugeen light, fixed white, visible $11\frac{1}{2}$ miles, built on a crib on the breakwater on the north side of the mouth of the Saugeen River, serves to guide fishing boats into the river. Chantry Island light, fixed white, 94 feet above lake level, visible $17\frac{1}{2}$ miles, is located on the north point of the island. This harbor affords excellent shelter with good anchorage in $2\frac{1}{2}$ to 4 fathoms,

behind the breakwaters extending from the northern end of Chantry Island, to within 400 feet of the breakwater extending from shore.

Chart: Lake Huron.

SOUTH BAY, ONT. *See Manitoulin Island.*

SOUTH END OF LAKE HURON. Available depth before improvement was 17 feet. *August, 1901.*—New channel is 2,400 feet wide and 21 feet deep at mean stage of water; available depth at present stage, about 20.5 feet. Corsica Shoal, with a depth of 17.7 feet at mean stage, lies $\frac{1}{2}$ mile, and Harlem Shoal, with a depth of 17.9 feet at mean stage, lies $\frac{1}{2}$ mile, east of the axis of the ship channel and abreast of Huronia Beach. Northwest Shoal, with a depth of 15 $\frac{1}{2}$ feet at mean stage, lies 1,250 feet S. $\frac{1}{2}$ E. of Lake Huron light vessel, No. 61. A shoal with spits having depths of 13 to 17 feet extends from Fort Gratiot light northward to beyond Gratiot Beach, where it is about $\frac{1}{2}$ mile offshore.

Charts: South End of Lake Huron; Lake Huron.

SPECTACLE REEF. *See Dangers—II. Entrance to Straits of Mackinac.*

SPRIGLEY BAY, ONT. *See Manitoulin Island.*

SQUARE BAY, ONT. *See Manitoulin Island.*

STRAWBERRY ISLAND CHANNEL, ONT. *See Manitoulin Island.*

STURGEON POINT, MICH. The easternmost point between Saginaw Bay and Thunder Bay. There is a coast light at this point, and a life-saving station 75 yards south of the light. The light is fixed white, 69 feet above the lake level, and visible 16 miles. A spit extends 1 mile ENE. from the point. It is reported that there is an unsurveyed shoal about 3 $\frac{1}{2}$ miles NNE. of the light and about 2 $\frac{1}{2}$ miles E. $\frac{1}{2}$ S. from "The Cove," with a depth of only 17 feet. It is supposed that the schooner *John Shaw* struck this shoal and sank.

Chart: Lake Huron.

SUGAR ISLAND, MICH. There is a good harbor of limited capacity between Sugar Island and Thunder Bay Island, with a depth of 13 feet, good holding ground, and protection from east, northeast, and northwest winds. The entrance is from the south; it is not safe for a stranger to enter from the north. The holding ground on the south of Sugar Island and on the southwest of Thunder Bay Island is not good, the bottom being rocky and stony. There is a life-saving station on the southwest side, and a special storm-warning display flagstaff on the extreme southeast end of Thunder Bay Island. The channel between Sugar Island and the main shore can be used only for small craft, and with caution, as there is foul ground, and but 10 feet draft can be carried safely. Spits extend southeast of Sugar Island and $\frac{1}{2}$ mile southeast of Thunder Bay Island.

Charts: Thunder Bay; Lake Huron.

SURVEYORS REEF. *See Dangers—III (a).*

TAWAS, MICH. *See East Tawas.*

THESSALON POINT, ONT. (NORTH CHANNEL, LAKE HURON). A hand fog horn has been established at Thessalon light station. It is used to answer signals from vessels in the vicinity of the station in thick weather.

Chart: Lake Huron.

THOMAS BAY, ONT. *See Manitoulin Island.*

THOMPSON POINT, COCKBURN ISLAND, ONT. *See Cockburn Island.*

THUNDER BAY, MICH. Next to Saginaw Bay, Thunder Bay is the most prominent indentation on the American shore of Lake Huron. The extreme points are North Point and South Point, 10 miles apart, and the distance to the mouth of Thunder Bay River from a line joining these two points is about 9 miles. It is safe to approach the north shore of the bay to within $\frac{1}{4}$ mile, except at North Point. (See North Point.) The southern portion of the bay from South Point to Ossineke is filled with shoals and flats, and shoal water extends from South Point about $2\frac{1}{2}$ miles northward to a point about $\frac{1}{4}$ mile beyond Scare Crow Island, thence curving and extending about W. by N. toward the mainland. Between the mouth of Thunder Bay River and Partridge Point the coast abounds in detached lumps, with least depths of 11 feet, for $1\frac{1}{2}$ miles from shore. Shoals connect Sulphur or Fletcher Island with the mainland and extend 1 mile northward to the island, curving toward Partridge Point. The bay affords shelter in all but southeasterly gales, and good holding ground is found generally under the shores. The north shore from Whitefish Point to North Point affords a good lee in heavy northeast gales, in depths of 4 to 5 fathoms, close to shore, with clay and sand bottom. The city of Alpena (see Alpena) and the village of Ossineke, at the mouth of Devil River, are situated on this bay. Ossineke formerly had large lumbering interests and good shipping facilities. It has one dock, in good condition, with about 8 feet of water.

Charts: Thunder Bay; Lake Huron.

THUNDER BAY ISLAND, MICH. See Sugar Island.

TOBERMORY HARBOR, ONT. Situated at the northwest extremity of the Saugene peninsula. The harbor consists of the Eastern Arm and the Southwest Arm, affording perfect shelter from all winds. The latter arm extends from Light-house Point W. by S. $\frac{1}{4}$ S. 900 yards with an average breadth of 100 yards. The low limestone shores sink almost perpendicularly to depths of 7 and 8 fathoms, which depth, over soft mud, will be found all over this arm excepting near the southwest end, where a muddy flat runs out 120 yards to a depth of 18 feet. As the arm is too narrow for vessels to lie at anchor conveniently, they are compelled to tie up to ringbolts sunk into the rocks. At the north entrance to the Southwest Arm there is a light-house showing a fixed red light 40 feet above the water, visible 9 miles. This is a storm-warning station. There are no dangers in the approach to this harbor, and, when the light is visible, it may be approached with confidence, day or night.

Charts: Coast Chart No. 7, Lake Huron; Lake Huron.

TOBIN REEF. See Dangers—III (a).

TOISMAVILLE, ONT. See Cockburn Island.

VIDAL BAY, ONT. See Manitoulin Island.

WAGOSH BAY, ONT. At the southwest point of Cockburn Island, Lake Huron, affords excellent anchorage, in $5\frac{1}{2}$ fathoms, mud and sand bottom, and protection from all but south and southeast winds. Wagosh Reef extends from the middle and northerly shore of the bay in a S. by E. $\frac{1}{4}$ E. direction for $1\frac{1}{2}$ miles with a least depth of 7 feet. McKay Reef, with a least depth of 12 feet, is an extension of Wagosh Reef, and lies 1 mile SSE. of it and $\frac{1}{4}$ mile SSW. from Pulpwood Point.

Charts: Coast Chart No. 8, Lake Huron; Lake Huron.

WAUBAUSHENE, ONT. A village of 700 inhabitants, on Matchedash Bay, the easternmost arm of Georgian Bay, on the Midland division of the Grand Trunk Railway. Has a sawmill and wharf. The approach to Waubauskene from Midland and the foot of Georgian Bay is a narrow and crooked channel; by the aid of 20 buoys 14 feet may be carried to the wharf. Without local knowledge a master of a vessel can not find his way even with a chart and sailing directions.

Chart: Lake Huron.

WEST BAY, ONT. *See Manitoulin Island.*

WESTERN DUCK ISLAND, ONT. *See Manitoulin Island.*

WHITNEY BAY, DRUMMOND ISLAND, MICH. *See Drummond Island.*

WIARTON, ONT. A town of 2,000 inhabitants, situated at the head of Colpoys Bay, a fine inlet on the west side of Georgian Bay. The town is 9 miles from White Cloud Island, which, with Hay Island, shelters Colpoys Bay from the heaviest seas of Georgian Bay. The breadth of the bay is 3 miles at the mouth and $\frac{1}{2}$ mile at the head off the town. The shores are marked by limestone cliffs 330 feet high, diminishing to about 200 feet near Wiarton. There is excellent anchorage in any depth under 10 fathoms from abreast of the village of Colpoys, $2\frac{1}{2}$ miles north of Wiarton, to the head of the bay, opposite the breakwater light, which is fixed red, 19 feet above the water, and visible 7 miles.

Chart: Lake Huron.

WOLSEY BAY, ONT. *See Manitoulin Island.*

ST. CLAIR RIVER.

Length, from Fort Gratiot to the southwest end of the United States Ship Canal (steamer track), about 40 miles. The actual navigable depth prevailing in the canal during the season of navigation does not exceed 19 feet.

The mean level of Lake Huron for the years 1860 to 1901, both inclusive, was 581.05 feet above mean tide at New York. The discharge of the St. Clair River for this elevation of the lake under normal conditions is 215,000 cubic feet per second. The increase in discharge per foot rise of the lake is approximately 19,000 cubic feet per second.

As a result of dredging operations during the past season the American channels (1) west of Stag Island and (2) west of the middle-ground opposite the city of St. Clair have been cleared to a depth of 20 feet at mean stage of water; the Squirrel Island Shoal has been cleared to the same depth, and the Light-House Establishment has removed the spar buoy by which the shoal has heretofore been marked.

Heretofore the Canadian side of the river has been generally utilized by all deep-draft vessels in passing the St. Clair middle-ground and Stag Island; but they can now use the American side, where easy and safe channels will be found with a least depth of 20 feet to within about 100 feet of the American shore. The least width of 20-foot channel west of Stag Island is 1,000 feet, and of that west of St. Clair middle-ground, 800 feet.

Charts: St. Clair River; Lake St. Clair.

ALGONAC, MICH. A village (population 1,216) and summer resort, opposite Russell Island, at the head of North Channel. It has a salt block, flour, saw, and planing mills, and boat building is extensively carried on. On the Detroit and River St. Clair Electric Railway. There is a steamboat landing and other docks with 12 to 15 feet of water. (*See also Russell Island Shoal.*)

Charts: Lake St. Clair; Shoal at head of Russell Island.

BELLE RIVER, MICH. *See Marine City.*

BLACK RIVER, MICH. *See Port Huron.*

CORUNNA, ONT. A village on the Canadian side of Stag Island Channel. There are range lights to guide through the best water past the shoals at the head of Stag Island and also past the shoals off the mouth of Talford Creek. The front light, near the old wharf at the foot of Fane street, is fixed white, 48 feet above the water surface, and visible $4\frac{1}{2}$ miles; the rear light stands on the west side of Beresford street, 568 feet S. by E. $\frac{3}{4}$ E. (S. $13^{\circ} 21'$ E., magnetic) from the front light, and is fixed white, 69 feet above the water surface, and visible $4\frac{1}{2}$ miles. The Lake Erie and Detroit River Railroad runs through the village.

Chart: St. Clair River.

COURTRIGHT, ONT. A village opposite St. Clair. The Michigan Central Railroad maintains a steam ferry between this place and St. Clair. There is good water along the wharves with depths of 15 to 20 feet. The Lake Erie and Detroit River Railroad runs through the village.

Chart: St. Clair River.

GRANDE POINTE, MICH. Opposite Grande Pointe dock the bottom is sand and quite uneven. The shoal having only 16 feet of water and formerly lying directly in front of the dock and 200 feet from the sailing line, has now been removed by dredging, so as to leave a clear depth of 20 feet for a width of 400 feet on the west side of the sailing line.

Chart: Lake St. Clair.

MARINE CITY, MICH. Original depth of Belle River at Marine City, 6 feet. The channel from the mouth of the river to the first bridge was dredged in 1897, 75 feet wide and 15 feet deep, and from there to Broadway Bridge, in 1899, 75 feet wide and 14 feet deep; present available depths, 14 and 13 feet, respectively.

Chart: St. Clair River.

MOORETOWN, ONT. A village $1\frac{1}{2}$ miles above Courtright. The Lake Erie and Detroit River Railroad runs through the village. There are two wharves with about 16 feet of water. Babys Creek enters the St. Clair River about $\frac{1}{2}$ mile below the village.

Chart: St. Clair River.

PINE RIVER, MICH. *See St. Clair.*

PORT HURON, MICH. United States Weather Bureau station; flagstaffs; United States custom-house; Kendall Marine Company, foot of Sarnia street; and Miller's coal dock; electric lights. The bar and middle-ground at mouth of Black River were dredged in 1898 to a general depth of 16 feet, increasing to 20 feet on the easterly portion adjoining the main ship channel; present available depth 14.5 feet between the gas buoy and American side of the river, and 20 feet between that buoy and the Canadian side. Original depth of Black River

at Port Huron was 10.5 feet. The channel dredged in the river in 1891-93 to a depth of 16 feet was found on examination, made April 20 and 21, 1900, to be in fair condition with an available depth of 15 feet up to the Grand Trunk Railroad bridge, excepting a small shoal above Tenth Street bridge, which has since been removed. The channel between the railroad bridge and Washington avenue has been redredged but is constantly deteriorating; the present available depth is probably less than 10 feet. The anchorage at the head of St. Clair River below the rapids, and abreast of Port Huron and Sarnia, is good in clay and gravel. In the rapids abreast of Point Edward it is rocky and bad. Good holding ground and some eddy will be found on the Canadian shore below the Grand Trunk elevator. Vessels should anchor as close to each shore as safety will permit, to leave the mid-channel clear for passing vessels.

Charts: St. Clair River; South End of Lake Huron; Lake Huron.

RUSSELL ISLAND SHOAL, AT THE HEAD OF RUSSELL ISLAND. Soundings taken June 9-15, 1901. The piles driven to mark the remains of crib, with but 8 feet of water over it, have been carried away and this danger is now marked by a red and black horizontal-striped spar buoy, moored in 13 feet of water. About 1,100 feet northeast of the sunken crib the point of the shoal extending from Russell Island is marked by a red and black spar buoy and a float showing a fixed white light. A small lithograph of this shoal, issued 1901, will be mailed free upon application to the U. S. Lake Survey Office, 33 Campau Building, Detroit, Mich.

Charts: Shoal at head of Russell Island; Lake St. Clair.

ST. CLAIR, MICH. Original depth of Pine River at St. Clair was 5 to 8 feet over bars. The channel from the mouth of the river to the shipyard was dredged, in 1897, to the depth of 14 feet, and from there to Belknap's brickyard, in 1899, 12 feet deep; present available depth, 13 and 11 feet, respectively.

In the St. Clair River, as a result of dredging operations during the past season, the American Channel west of the middle-ground opposite St. Clair has been cleared to a depth of 20 feet at mean stage of water. Heretofore the Canadian side of the river has been generally utilized by all deep-draft vessels in passing the St. Clair middle-ground, but they can now use the American side, where an easy and safe channel will be found with a least depth of 20 feet to within about 100 feet of the American shore. The least width of the 20-foot channel west of the St. Clair middle-ground is 800 feet.

Chart: St. Clair River.

SARNIA, ONT. A city at the head of St. Clair River, and opposite Port Huron. Population in 1900, 8,176. Connected with Port Huron by a tunnel under St. Clair River, and by a regular steamboat ferry. An important harbor of the Grand Trunk Railway system. Stopping place for all Canadian passenger steamers passing through the St. Clair River. From the foot of George street $3\frac{1}{4}$ to 5 fathoms can be carried close to shore in front of and below the Grand Trunk depot and continuing down to Frome field. A bay with shallow water extends from the foot of George street up to Point Edward. The anchorage at the head of St. Clair River, below the rapids and abreast of Port Huron and Sarnia, is good in clay and gravel. In the rapids abreast of Point Edward it is rocky and bad. Good holding ground and some eddy will be found on the Canadian shore below the Grand Trunk elevator. Vessels should anchor as close to each shore as safety will permit, to leave the mid-channel clear for passing vessels.

Charts: St. Clair River; South End of Lake Huron; Lake Huron.

SOMBRA, ONT. A small village opposite Marine City, with two wharves, $\frac{1}{4}$ mile apart, extending about 200 yards in shallow water to 18 feet at the outer ends. The channel on the American side is straighter and wider and most frequently used.

Chart: St. Clair River.

STAG ISLAND. As a result of dredging operations during the past season the channel has been cleared to a depth of 20 feet at mean stage of water. Heretofore the Canadian side of the river has been generally utilized by all deep-draft vessels, but they can now use the American side, where an easy and safe channel will be found, with a least depth of 20 feet to within about 100 feet of the American shore. The least width of 20-foot channel west of Stag Island is 1,000 feet. The temporary light established on the shoal extending south from Stag Island was, on July 12, 1901, replaced by a stronger light shown from a more permanent structure established by the Government of Canada. The light is shown from a pressed-glass lens lantern hoisted on a mast, with a small shed at its base, the mast and shed painted white; they stand upon a platform built on a pile foundation. The platform is elevated 4 feet above the summer level of the river, and the mast is 11 feet high. At the upstream end of the platform from which the light is exhibited, a pile-work ice breaker has been built. The light is fixed white, elevated 14 feet above the level of the river. It should be visible 4 miles in every direction except where obstructed by the mast.

Chart: St. Clair River.

SQUIRREL ISLAND. The shoal has been cleared to a depth of 20 feet at mean stage of water and the Light-House Department has removed the spar buoy by which the shoal has heretofore been marked.

Chart: Lake St. Clair.

LAKE ST. CLAIR.

Length, steamer track, lighthouse at southwest end of United States

Ship Canal to Windmill Point lighthouse	miles..	17
Length (right line, on about 82° 45')	do....	26
Breadth (right line, on about parallel 42° 5')	do....	24
* Area of water surface	square miles..	445
* Area drained (including area of water surface of St. Clair River)	do....	6,335
* Area, total of basin	do....	6,780
† Rainfall, average annual	inches..	35
* Opening of navigation, average date at St. Clair Flats lighthouse, Michigan		Apr. 4
* Closing of navigation, average date at St. Clair Flats lighthouse, Michigan		Dec. 15

TWENTY-FOOT CHANNEL THROUGH LAKE ST. CLAIR. Depth before improvement at Grossepoint Flats, 15 feet. The new ship channel, completed in 1897, is 800 feet wide and 20 feet deep at mean stage of water, but there are two or

* Deep Waterways Commission, 1896.

† United States Weather Bureau.

three small spots in this channel within 100 feet of its sides that have only 17 feet of water. There are four sunken cribs near the edges of the channel, two on each side having a depth of from 2 to 10 feet of water over them and are marked by gas buoys placed about 30 feet abreast on the edges of the channel. The red and white barrel buoys which were located as near as possible over the wrecks of the four cribs, during the past two seasons, have been discontinued, and will not be replaced this season. Small vessels and yachts should give above obstructions a wide berth. This channel connects with the improved channel of same depth through the St. Clair Flats; the available depth, with the stage of water now prevailing, is about 19½ feet. Vessels drawing 12 feet need not confine themselves to this channel, but can safely take the straight NE. ¼ E. course through the lake from head of Detroit River to the St. Clair Flats Canal.

Chart: Lake St. Clair.

CLINTON RIVER, MICH. Original depth, 4 to 5.5 feet. *August, 1901.*—Channels were dragged in 1897 through shoal places in the river to a depth of 8 feet and 50 to 75 feet wide, and the entrance channel adjoining the pile dike, 100 feet wide. An examination was made July 14, 1900, and the dredged channels were found deteriorating. The present available depth up to Mount Clemens is probably less than 7 feet.

Chart: Lake St. Clair.

GROSSEPOINT FARMS, MICH. An incorporated village with summer residences, situated 3 miles northeast of Windmill Point and the head of the Detroit River. Population 817. Four piers with 6 to 10 feet of water, extending into the lake from 200 to 400 yards, form a limited protection for the many private steam launches and sailing yachts owned by residents. The yearly ice floes in the early spring cause considerable damage to these piers, which are private property and their use by strangers is prohibited. Grossepoint dumping ground, 1½ miles off the Club House dock, runs in an ENE. direction 1½ miles, with a width of ¼ mile and a least depth of 6 feet, and should be avoided.

Chart: Lake St. Clair.

MOUNT CLEMENS, MICH. *See Clinton River.*

NEW BALTIMORE, MICH. A village (population 922) situated on the shore of Anchor Bay, and on the Electric Rapid Railway system. Has a planing mill, grain elevator, stave and heading works. Steamers to Detroit daily during the summer. The water in Anchor Bay has a maximum depth of 13 feet at the present stage, but not more than 10 feet can be carried into the bay from the lake. The docks in front of the village have only about 8 feet of water.

Chart: Lake St. Clair.

ROCHESTER, ONT. A village at the mouth of Belle River, south shore of Lake St. Clair. An open roadstead with no docks or lake commerce. The Grand Trunk Railway runs through the village.

Chart: Lake St. Clair.

ST. CLAIR FLATS CANAL. The width of water way between revetments is 292 feet, and length of each lateral dike 7,221 feet. Improved channel 20 feet deep, beginning at deep water of St. Clair River, above St. Clair Flats Canal, with a width of 650 feet; thence gradually narrowing to the canal; thence for the full width of the canal through its entire length; thence gradually widening (on

the west side) to 400 feet where a depth of 20 feet is reached in Lake St. Clair. Available depth at present stage of water, about 19½ feet.

RULES AND REGULATIONS prescribed by the Secretary of War for the government of ST. CLAIR FLATS SHIP CANAL; in force from and after July 1, 1895:

(The first three paragraphs relate to administration.)

Definition: St. Clair Flats Ship Canal comprises the dikes, the water between the dikes, and the improved channels of approach both above and below the dikes.

4. The custodian of the canal, either by himself or through assistants, shall direct the movements of all vessels, boats, and other floating things in the canal, and of all persons upon the dikes. The directions, orders, and instructions given by him or his assistants in directing the movement of any vessel, boat, or other floating thing in the canal shall be obeyed by all persons in charge of or employed upon said vessel, boat, or other floating thing, and by each and every person upon the dikes.

5. All persons in charge of, or employed upon vessels or boats are forbidden to throw anything into the canal or to cause or permit their respective vessels—

To land or tie up to the banks unless on government business.

To enter the canal two or more abreast.

To pass another vessel or boat while going in the same direction in the canal.

To follow another vessel or boat at a distance of less than 500 feet except when in tow.

To pass the canal in more than one line going each way.

To obstruct the canal in any way, or to intentionally delay, by slow passage through the canal, or by any other means, the progress of other vessels or boats navigating the same.

To hug the canal banks in passing, or to deviate more from the middle of the canal than is necessary for safe navigation.

To attempt passing the canal in the face of running ice without the express permission of the custodian of the canal.

To pass the canal at a rate of speed exceeding 8 miles per hour.

6. No one in charge of, or employed on, a sailing vessel shall cause or permit such vessel to beat through the canal. He shall tow the vessel through or wait for a fair wind.

7. No one in charge of, or employed on a vessel, however propelled, shall cause or permit such vessel to pass through the canal with its sail or sails up, unless it be a sail vessel running with a fair wind.

8. No one in charge of, or employed on a vessel, shall cause or permit such vessel to enter, or attempt to pass through, the canal, at a time when the available depth of water in the canal is not as great as the draft of the vessel; and the custodian of the canal shall, from time to time, announce in the marine columns of the newspapers the available depth of water in the canal.

9. To prevent blockades in the canal or its approaches, the custodian of the canal is authorized to detain any vessel at either end thereof until, in his opinion, a safe passage can be secured, and no one shall do anything to interfere with or prohibit his doing so; or anything that will tend to, or is likely to, interfere with or prohibit his doing so.

10. All persons are prohibited from willfully or carelessly injuring or damaging the revetment work of the dikes, or the trees growing on the dikes, or any of the government buildings or other public property pertaining to the canal or the dikes, or any part thereof.

11. In case of any boat, vessel, or other craft, or raft, sinking or grounding in the canal, or otherwise obstructing it, the officer, or agent, of the United States in charge of the canal, shall have the right to take such possession of such vessel, boat, or other craft, or raft, as shall be necessary for the purpose, and remove it, and clear the canal of the obstruction caused by it, and no one shall interfere with or prohibit him from doing so; or do anything that will tend to interfere with, or prohibit him from doing so: *Provided*, That the officer, or agent of the United States, may, in his discretion give notice in writing to the owners of any vessel, boat, or other craft, or raft, obstructing the canal as aforesaid.

Chart: Lake St. Clair.

U.S. M.

DETROIT RIVER.

(Chart No. 56, Detroit River, was canceled by Chart No. 97, Detroit River (in colors), issued September 6, 1901.)

Length, steamer track, Windmill Point lighthouse to Bar Point Shoal light-ship, about 28½ miles.

The mean level of Lake Erie for the years 1860 to 1901, both inclusive, was 572.73 feet above mean tide at New York. The discharge of the Detroit River for this elevation of the lake, under normal conditions, is approximately 218,000 cubic feet per second. The increase in discharge per foot rise of the lake is approximately 19,000 cubic feet per second.

There is a United States Weather Bureau station at Detroit; steel tower on roof of Union Trust Building; flagstaffs on United States mail boat and on Smith's coal dock; electric lights.

There is a Canadian storm-warning station at Amherstburg, Ont. Signal mast on the wharf near waterworks wharf.

The available depth which can be carried through the river is 18.5 feet, and this limiting depth is confined to that section between the Limekiln Crossing and the south end of Bois Blanc Island.

The contractors engaged in improvements between the head of Ballards Reef and foot of Bois Blanc Island have made good progress during the past season, but it is not yet safe for vessels to pass over the area on which they have been engaged; 6 dredges, 4 steam-drill scows, 2 or 3 derrick scows with divers working from them, and several tugs, dumping scows, etc., are constantly engaged in the work. These conditions require that all vessels passing this locality should exercise extreme caution, and take special care to check down to the lowest speed consistent with safe steerageway in the vicinity of the dredges, drill and derrick scows.

Charts: Detroit River; Lake Erie.

From the head of Ballards Reef to deep water in Lake Erie the general depth of channel is 20 feet or more at mean stage of water, but on account of scattering shoals and boulders it is still unsafe for vessels to attempt passage on a draft of more than 19 feet when the water surface is at its mean level; but the actual depth is likely to be much less when strong westerly winds prevail. The conditions now existing at mean stage of water are as follows:

Ballards Reef Channel. For a width of 300 feet on the east side of Grosse Isle Lower Range, the channel has a clear depth of 21 feet; for a width of 300 feet on west side of that range the least depth is 18.5 feet, with work in progress to make it 21 feet.

Charts: Detroit River; Lake Erie.

Limekiln Crossing. The width of improved channel is 440 feet, with a least depth of 19 feet. Work is in progress to increase the width to 600 feet and the depth to 21 feet. To the westward of the area now under improvement there is a channel 250 feet wide, with a clear depth of 18 feet, and light-draft vessels should follow this auxiliary channel.

Charts: Detroit River; Lake Erie.

Bois Blanc Range. The channel is 500 feet wide, with a least depth of 19 feet.

Charts: Detroit River; Lake Erie.

Amherstburg Reach. The channel indicated by temporary target range on Bar Point is 280 feet wide and has a least depth of 19 feet. Work is in progress to increase the width to 500 feet and the depth to 21 feet.

Charts: Detroit River; Lake Erie.

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Hackett Range. The channel is 500 feet wide for the greater part of its length, with a least depth of 19 feet.

Charts: Detroit River; Lake Erie.

Bar Point Shoal. The dredged channel through this shoal, extending to the Detroit River lighthouse, is 800 feet wide and has a clear depth of 20 feet.

It is reported that vessels occasionally ground about 800 feet southeast of the light station during a low stage of water caused by west winds.

Charts: Detroit River; Coast Chart No. 7, Lake Erie; Lake Erie.

DELRAY, MICH. A suburb of Detroit and an incorporated village, situated at the mouth of Rouge River. (See Rouge River.) Population 4,573. Large manufacturing enterprises are located here, including the Solvay Process Company's soda ash plant, Michigan Carbon, Sulphite Fibre and Malleable Iron Works, lumber and planing mills, Sutton Manufacturing Company's glue works, etc. The Michigan Central Railroad, Wabash, Lake Shore and Michigan Southern, Pere Marquette, and Detroit Southern steam roads, and an electric railway from Detroit to Trenton, pass through or have spur tracks. The Solvay Process dock at the mouth of Rouge River has 16 feet of water with good shipping facilities.

Chart: Detroit River.

ECORSE, MICH. A village (population 550) at the mouth of Ecorse River, and on the Wyandotte Channel of the Detroit River, 9 miles below the city of Detroit. Has a salt block, saw and planing mills. The Wyandotte and Detroit River Electric Railway, the Lake Shore and Michigan Southern, the Michigan Central, and the Detroit Southern railways pass through the village.

Charts: Detroit River; Lake Erie.

HURON RIVER, MICH. At the head of Lake Erie and mouth of Detroit River, and about 1½ miles north of Pointe Mouillee. At the mouth, the river runs through marshy land; the least depth over the bar is 2½ feet; inside of the bar the depth is 10 to 16 feet; the 12-foot contour runs about 1 mile out. No improvements made.

Charts: Detroit River; Coast Chart No. 7, Lake Erie; Lake Erie.

ROUGE RIVER, MICH. Original depth at entrance, 11 feet. The channel dredged in 1892 to depth of 16 feet from the mouth to the Wabash Railroad bridge, having shoaled since the work was completed, it was redredged during the season of 1900, restoring the 16-foot channel with a width of not less than 50 feet. Between the Wabash Railroad Bridge and the Detroit Salt Works a channel not less than 50 feet wide and 13 feet deep has also been dredged. Present available depths are probably 15 and 12 feet, respectively.

Chart: Detroit River.

SANDWICH, ONT. A town, population 1,450, the judicial seat of Essex County, located opposite Fort Wayne, and about 2 miles below Windsor. It has about 1½ miles of river frontage, with shallow water between the edge of the channel and the shore, a width of about 250 yards. There is little or no commerce. The Canadian coaling station of the Pittsburg Coal Company is located here, and has a good dock and good water. The other wharves are old and dilapidated. Electric cars run from Sandwich to Windsor and Walkerville.

Charts: Detroit River; Lake Erie.

TRENTON, MICH. A village (population 1,167) situated on the west bank of the American Channel, opposite Grosse Isle. Thirteen feet draft can be carried from Wyandotte along the American Channel to the Trenton docks, but the navigable depth to the mouth of the Detroit River and Lake Erie is limited to 9 feet through crooked and narrow channels. Church & Co.'s extensive chemical works are located to the north of the village, and they also control the Sibley quarry and dock 1 mile north of their works. The Michigan Central Railroad, the Lake Shore and Michigan Southern Railway, the Detroit Southern Railroad, and the Detroit and Wyandotte Electric Railway, pass through the village. There is a steam ferry to Grosse Isle. The Michigan Central Railroad bridge crosses the American channel to Grosse Isle at a point 1 mile below Trenton.

Charts: Detroit River; Lake Erie.

WALKERVILLE, ONT. A flourishing manufacturing town (population 1,595) opposite Detroit and 1 mile east of Windsor. It is connected with Windsor by electric cars and with Detroit by a steam ferry to the foot of Campau avenue. It is on the Grand Trunk Railway, and a terminal station of the Lake Erie and Detroit River Railway. Walker's distillery, with grain elevators, are conspicuous landmarks. There is 20 to 24 feet of water at Walker's distillery dock. Electric lights displayed at night form good aids to navigation for the traffic passing through the Main or Canadian Channel.

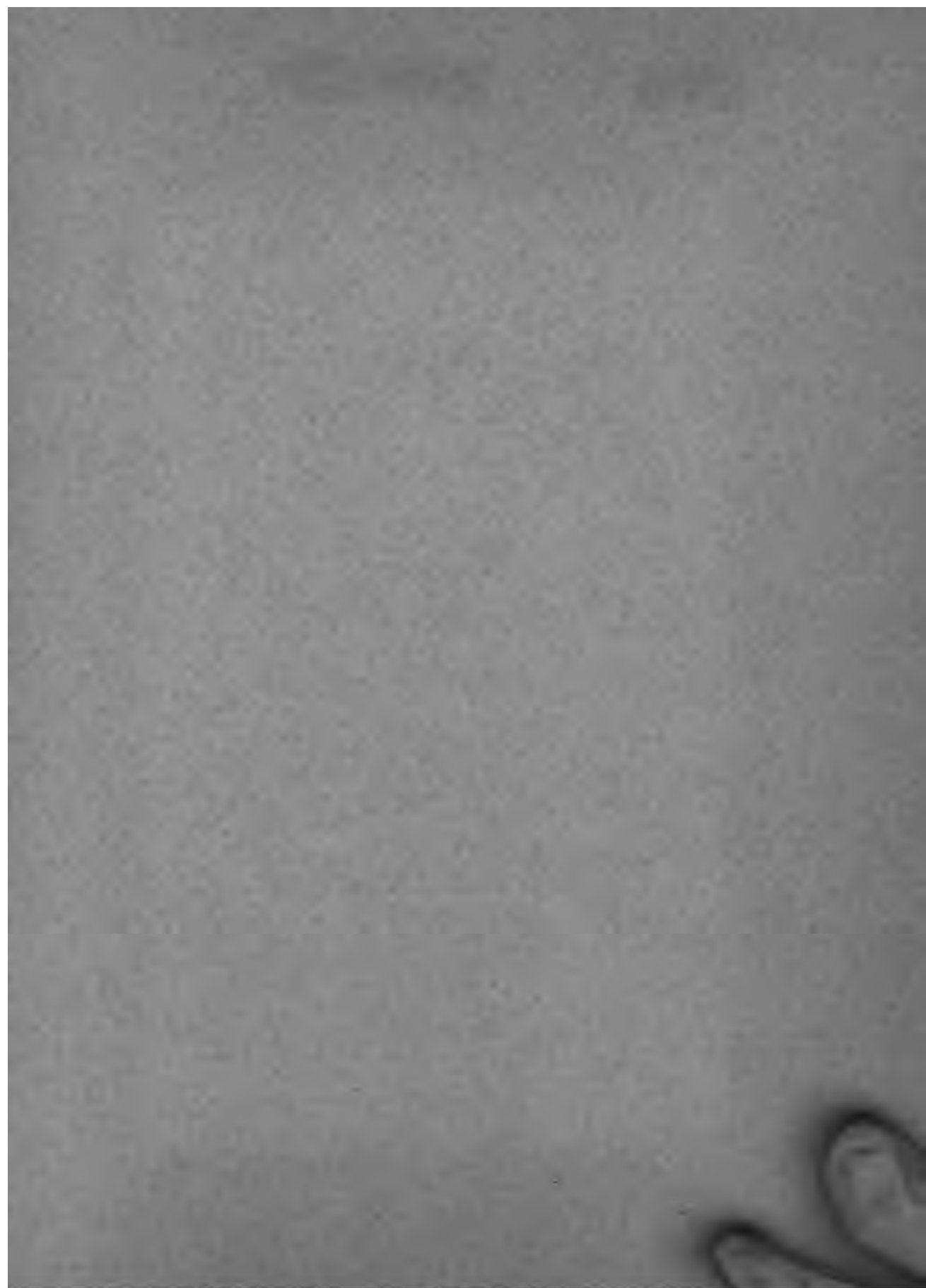
Chart: Detroit River.

WINDSOR, ONT. A city (population 12,154) opposite Detroit. Port of entry and custom-house. A stopping place for all Canadian passenger steamers passing through Detroit River. It has 2 miles of river front lined with docks and railway transfer slips, all of which have from 3 to 4 fathoms of water. The Grand Trunk Railway, Canadian Pacific Railway, and the Michigan Central Railroad transfer their freight on steam-car ferries to and from Detroit.

Chart: Detroit River.

WYANDOTTE, MICH. A manufacturing city (population 5,183) situated on the American Channel opposite its junction with the Point Hennepin or West Mamajuda Channel at the head of Grosse Isle. The most important industries are: The Detroit Dry Dock Company's shipyards for iron and steel vessels; Michigan Alkali Chemical works; the J. B. Ford's Company's soda ash works; starch, stave, heading, and hoop works, boat works, etc. There is good water all along the docks and river front.

Charts: Detroit River; Lake Erie.



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